All Winner Technology CO., Ltd

A10 development board hardware manual
V1.1
August 24, 2011

Version History

Version number	Date	Modifications	Remarks
V1.0	2011-6-7	The initial version	
V1.1	2011-8-24	According to EVB-V1-2, revise and improve the	

All Winner Technology CO., Ltd

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1 A10 Development Board introduction

1.1 A10 Overview

A10 uses ARM's Cortex-A8 processor, to build a whole new generation of intelligent network processor SOC HD-A10, which will significantly enhance the level of SOC applications, multimedia consumer electronics products and make the user experience has increased substantially and improve the . A new generation of highly integrated processors will be the leading network video performance and cost-effective features, widely used in tablet PCs, home intelligent HD network players, automotive multimedia controller, network security monitoring, and a variety of portable multimedia entertainment products and other emerging the market.

The A10, with technology to further promote the application of high-definition video codec technology, SOC in the next-generation network integrates high-definition H.264 high Profile of 1080P coding techniques. Full high-definition format decoding technology will meet the multi-channel decoding applications 1080P View.
The A10, with its own high-efficiency technology in the advanced graphics acceleration framework, but also the introduction of ARM's MALI400 2D/3D graphics processor, to more smoothly support the popular operating systems such as intelligent android2.3/3.0 for android product performance and user experience will greatly enhance and improve.

1.2 Development Board Features

A10 development board is designed specifically for the A10 chips, compact, full-featured, flexible. Primarily for business for the A10, tablet PCs, home intelligent HD network players, automotive multimedia controller, network security monitoring, and a variety of products such as portable multimedia entertainment software and hardware development, debugging platform, or product design information.

1.2.1 Super video codec

Support full HD (1920 * 1080P) video decoding, H.264, H.263, VC-1, MPEG-1/2/4, DIVX-3/4/5 / 6, XVID, WMV7 / 8, VP8, VP6 , AVS jizun, supports all major formats and other high-definition video package almost all HD video formats; support for JPEG and H.264 encoding (1080P @ 60fps; 720P @ 100fps)

Support H.264 encoding, 1080P @ 60fps, 720P @ 100fps.

1.2.2 Powerful audio capabilities

Music player supports all mainstream music, such as MP3, WMA, OGG, FLAC, APE, AAC, ATRA, etc.

1.2.3 Picture browsing

Support high-definition JPEG, GIF, BMP formats. Maximum image size supported 16384x16384 (for 4:4:4 color formats)

1.2.4 Features full e-book

Support E-book, you can read epub, pdf, fb2, pdb, chm, html, txt and other format e-books; support ANSI / ASCII, UTF-8, UTF16-BE, UTF16-LE, GB2312, EUC-KR, SHIFT -JIS, Windows-1250/1251 other encoding formats; support English, Simplified Chinese, French, Italian, Spanish, Dutch, Traditional Chinese, Japanese, Korean and other languages.

1.2.5 Large-capacity storage

256M 32 位 DDR2, 4G NAND memory, expandable to 8G (ECC 64, support for Samsung, Toshiba, Hynix, Microm, Intel and other 5xnm, 4xnm, 3xnm, 2xnm process NAND);

1.2.6 Super-rich peripheral interfaces

USB2.0 OTG, USB2.0 HOST, HDMI1.3/1.4, LCD, CVBS-OUT, VGA-OUT, SATA, LINE-IN、HEADPHONE、 10/100M Ethernet interface, 2 Camera Sensor Interfaces, SDIO WIFI, GPS、 Gyroscope, Light Sensor, Bluetooth, Compass.

1.2.7 A variety of start-up mode

A variety of system startup, including NAND FLASH, SD / MMC card start-up; support USB for flashing.

1.2.8 A variety of operating systems

Support for the major operating systems, Android 2.3.4, Linux2.6, WinCE6.0.

1.3 Development board configuration

1.3.1 Standard

1. A10 development board
2. USB to serial debug line (USB switch to TTL)
3. 12V @ 2A power adapter
4. 5-inch LCD with touch screen module (TFT 800 * 480 high-definition, four-wire resistive touch screen)

A10 Development board

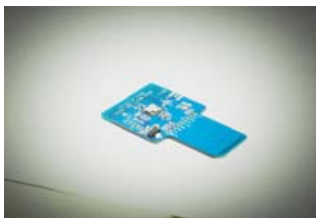
USB to serial debug cable

Power adapter

并口线

1.3.2 Optional

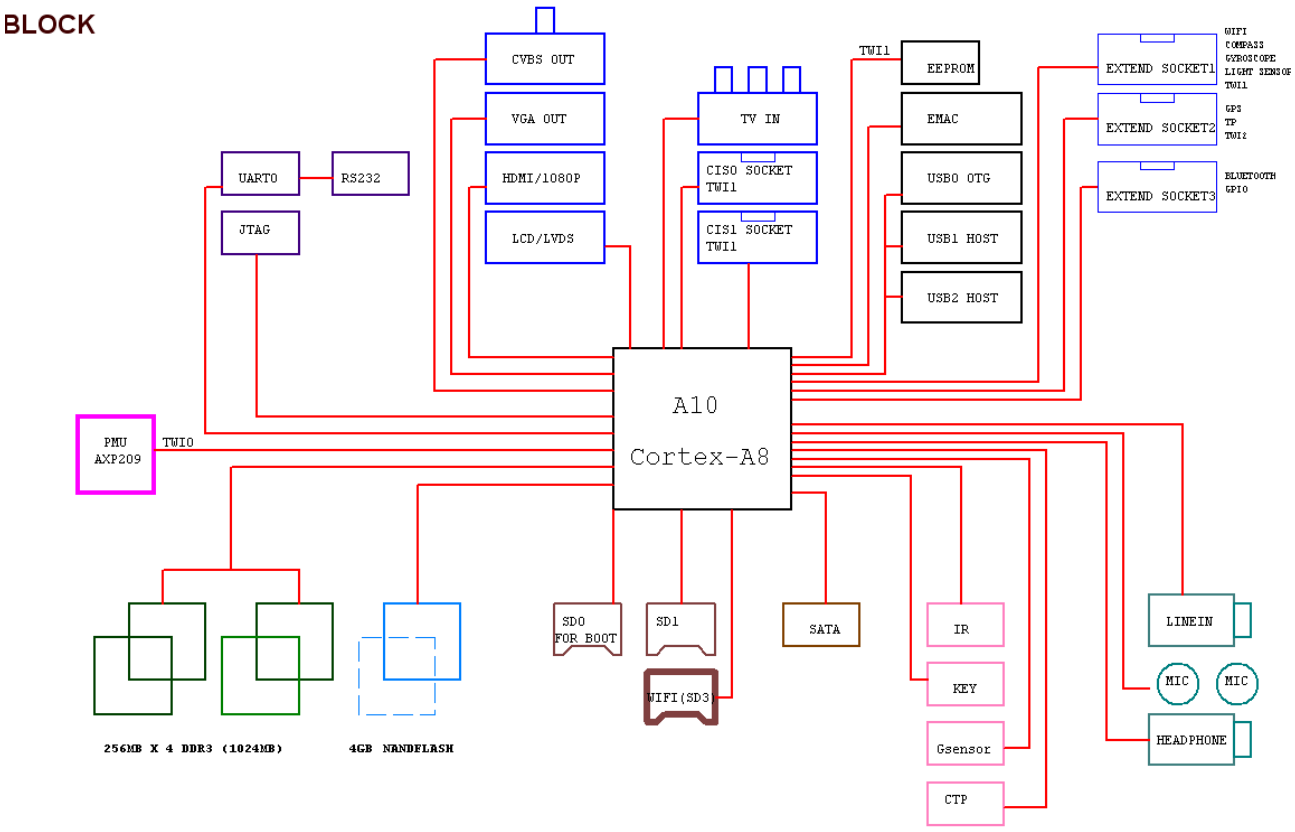
1. head board camera
2. SDIO WIFI module
3. 7-inch LCD with touch panel module (TFT 800 * 480 high-definition, TTL interface)



SDIO WIFI module

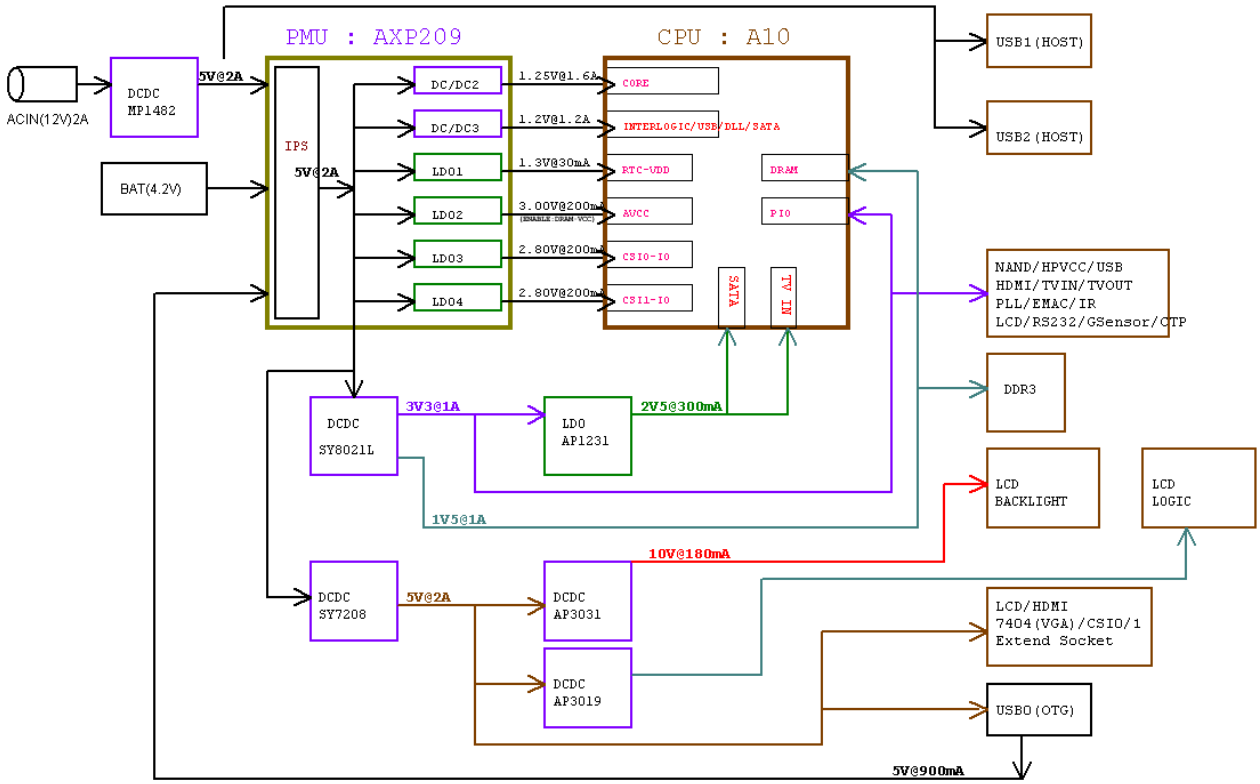
Camera head board

1.4 Functional block diagram of the development board



1.5 Power tree diagram of the development board

POWER TREE



1.6 Typical Applications

- Tablet PC
- Smartphones
- Smart TV
- Video surveillance, traffic recorder, DV and other codec devices.
- Smart Playlist box, sound bar, speakers and other home theater.
- Games, advertising machines, industrial machines and other interactive devices.

- GPS, car entertainment systems.

1.7 Documentation

- A10 Development Board Hardware User's Manual
- A10 Android development board manual
- A10 development board Linux Manual
- A10 WinCE6.0 development board manual
- A10 development board schematics.
- A10 Datasheet
- AXP209 Datasheet

1.8 Contact

Company: Zhuhai Zhi Technology Co., Ltd. all

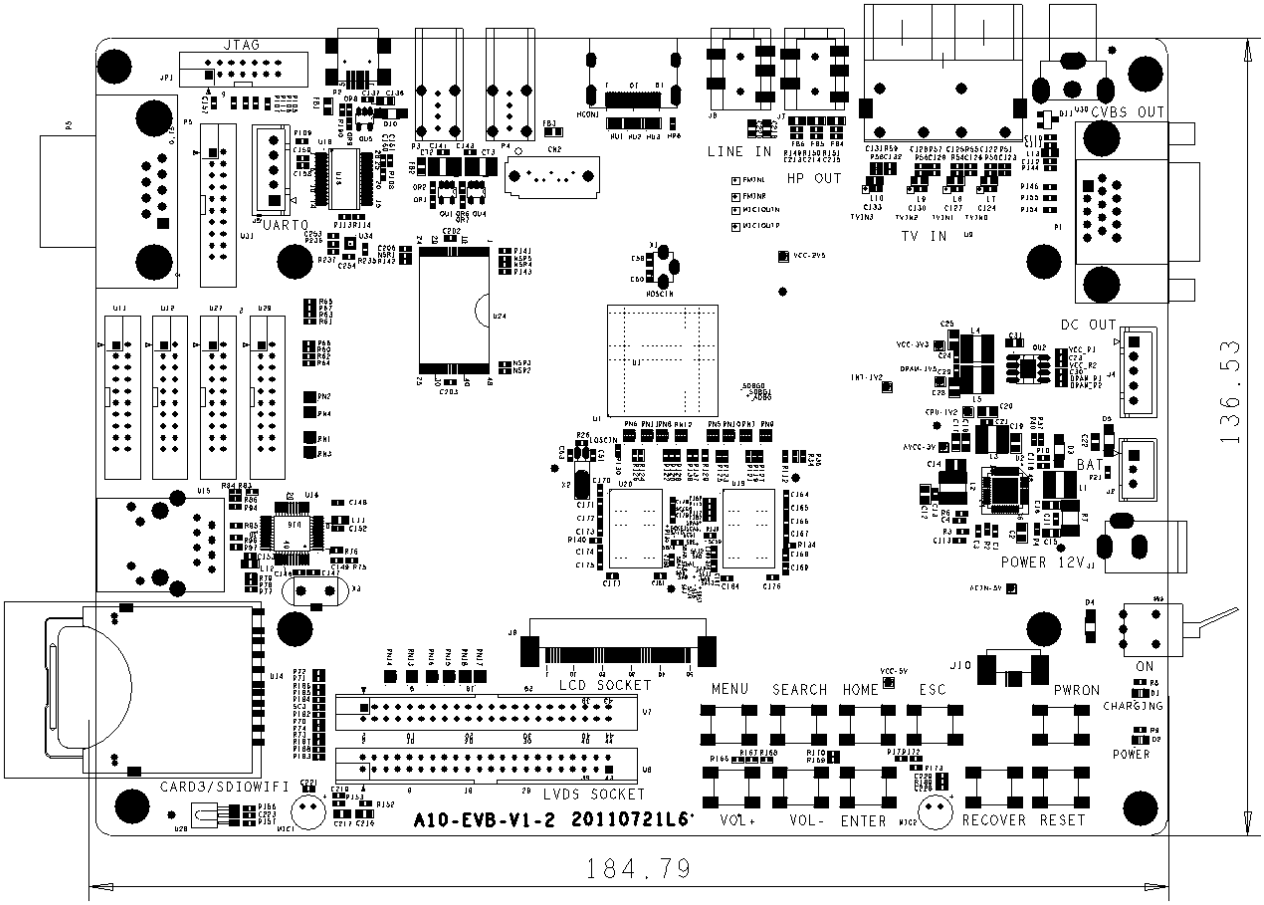
Address: Zhuhai Southern Software Park Building, 4th Floor B6

Tel :0756 -3818315

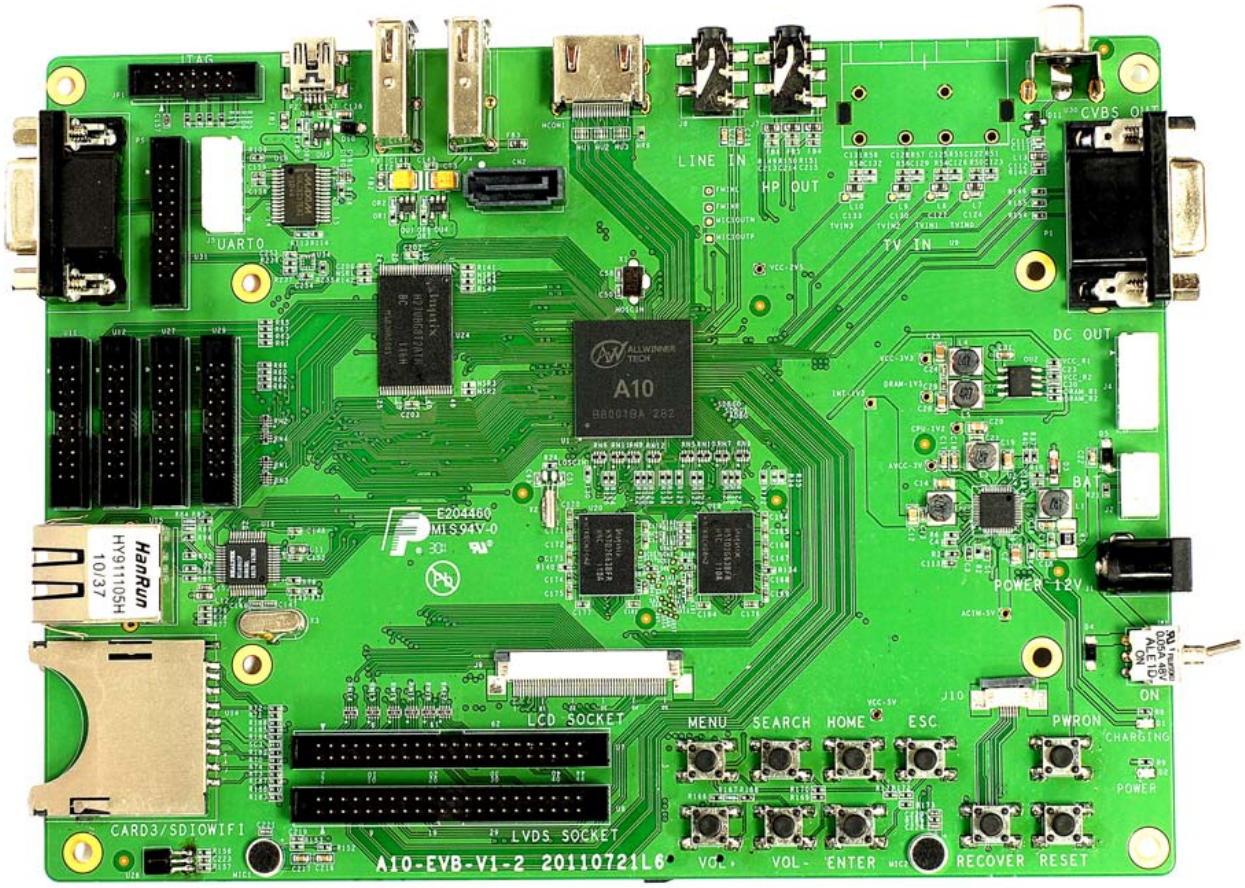
Fax :0756 -3801678

1.9 Chapter II hardware resources

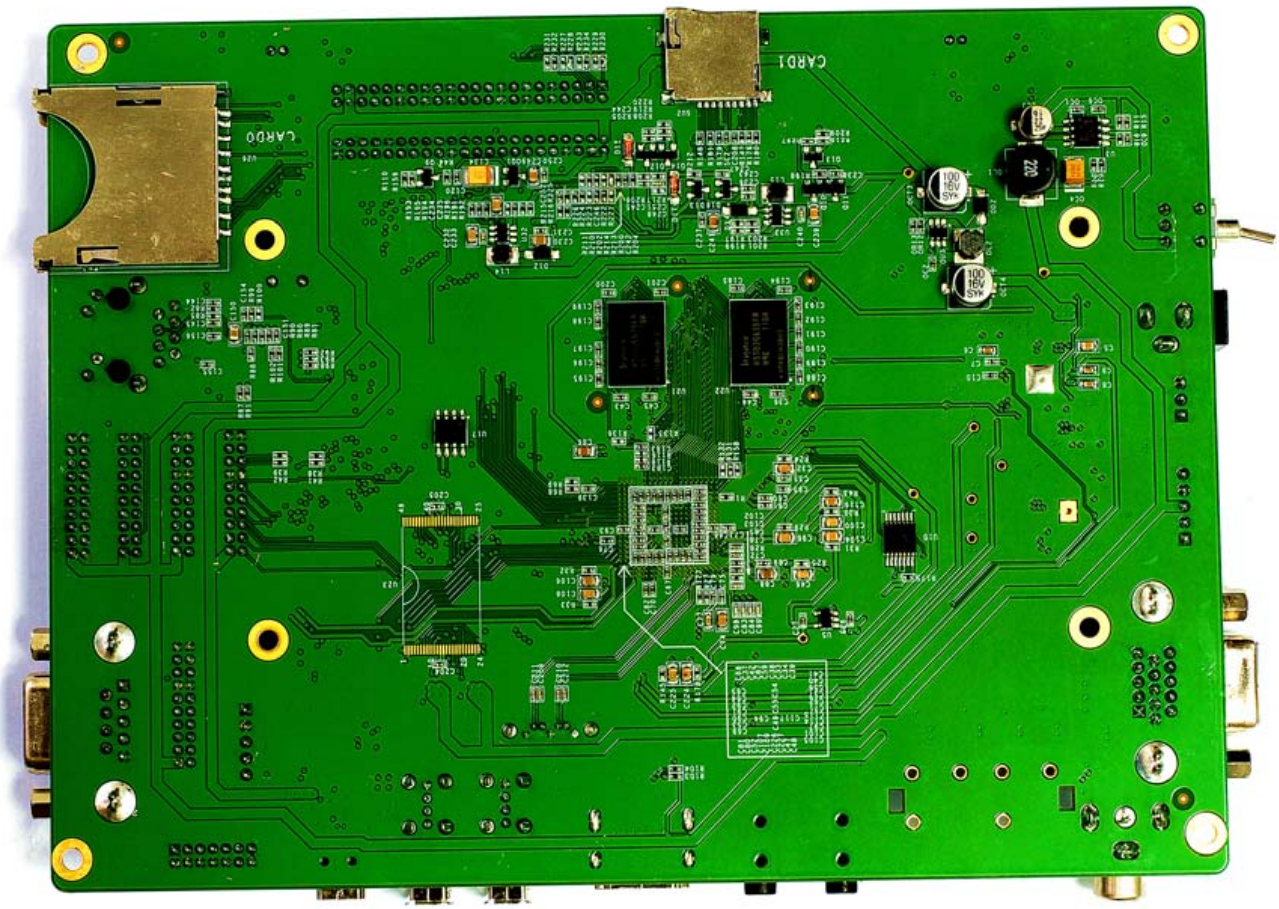
1.10 Dimensions diagram



1.11 Front picture



1.12 Back picture



1.13 Hardware resources

Name	Description
CPU	Cortex-A8 32KB I-Cashe, 32KB D-Cache and 256KB L2 Cache Trustzone Technology
PMU	X-Power AXP209 "flash charge core", 1.8A PWM switching charge, intelligent power management controller, can receive 5V power adapter, battery, USB5V power input, to provide 7 power outputs
DRAM	4 2Gbit 16 DDR3, total 1024MB DRAM.
NAND Flash	Hynix H27UBG8T2A, 4G Bytes MLC 64bit ECC NAND Flash, the board can be expanded to two a total of 8G Bytes. Can be used as boot device.
TF Card Interface	Memory card can support up to 32G. Card detection
SD / MMC card interface	Support SD / MMC card reader can be used as boot devices.
SDIO WIFI card interface	For SDIO WIFI card

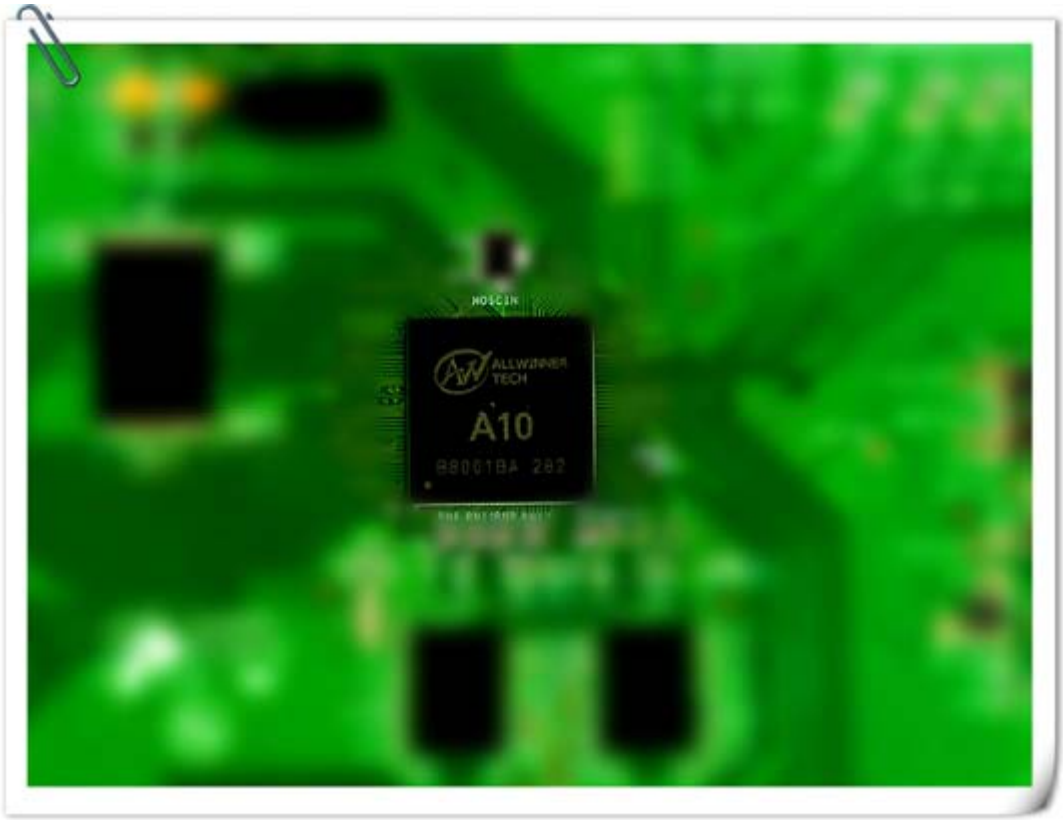
Ethernet	10M/100M IEEE802.3, uses chip Realtek RTL8201CP RJ45 connector
USB Host	2 USB Host interfaces, can support high-speed (HS, 480-Mbps), full-speed (FS, 12-Mbps), and low-speed (LS, 1.5-Mbps) data transmission
USB OTG	USB OTG 2.0. Host mode can support high-speed (480-Mbps), full-speed (12-Mbps) and low-speed (1.5-Mbps) data transfer. Device mode can support high-speed (480-Mbps), and full-speed (12-Mbps) data transfer
TV-OUT Interface	CVBS (commonly known as AV) output
VGA-OUT Interface	VGA output, maximum support 1920 * 1080 resolution
HDMI output	HDMI v1.3, up to 1080P @ 50/60fpts
LCD	Provides one 50pin FPC interface, one LCD screen interface as a 44pin IDC Interface expansion Development, can support a variety of screen sizes: The following CPU 3-inch screen; 3-inch RGB display; 8 inch LVDS panel
TouchPanel interface	Supports 4-wire resistive touch screen Interface capacitive touch screen and TWI
Camera sensor interface	Camera sensor offers two sets of interface signals. NTSC and PAL CCIR656 Protocol support 8-bit input data
Microphone	Supports 2-way MIC input
Headphone	Stereo headphone output.
Line-in	2 audio inputs.
TWI	Development board provides two sets of TWI interfaces
UART	Provides one UART interface: TTL level or RS232 level.
JTAG	JTAG debug interface.
Buttons	Provides five definable function keys and RESET and POWER_ON keys.
Infrared data reception	IR supports only infrared data reception.
Battery Interface	Such as single-cell 4.1V/4.15V/4.2V/4.36V lithium battery, rechargeable.
AC adapter connector	12V DC power supply.

The third chapter details the hardware

This section will describe in detail the various hardware development board A10 module, interface, technical parameters, pin definitions, related configuration, use precautions.

1.14 CPU

The A10 CPU is a cost effective, high integration, high performance, low-power 16/32-bit multimedia applications processor. The CPU core is a Cortex-A8 with 32KB instruction, 32KB data and 256K L2 caches. The CPU integrates many features to reduce overall system cost and product development effort. Using 441 pin 0.8mm pitch BGA package. Small size, low power, low heat.



1.15 Power supply

1.15.1 Power input

Tha A10 board can use any compination of the 12V power adapter, battery os USB power. The PMU will do the smart choice to determine:

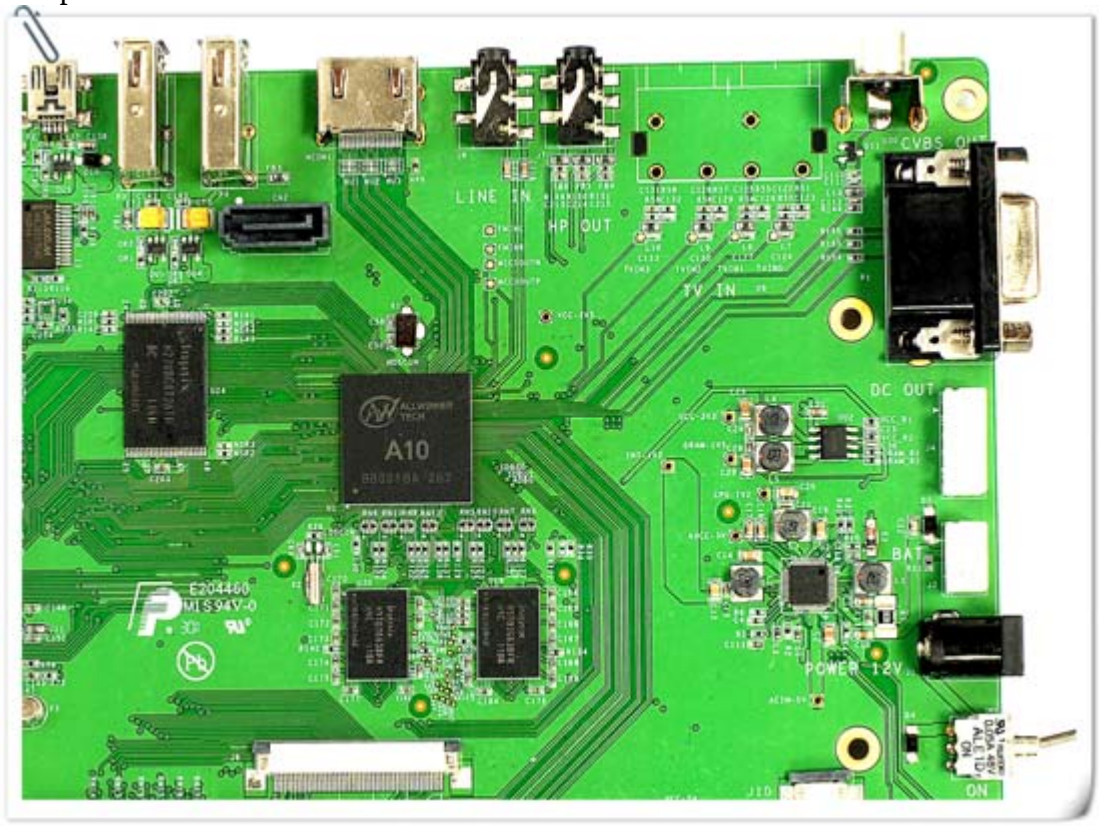
1. 12V power adapter, input from the J1 connector, provides up to 2A current. 12V DC power supply through one DCDC chip MP1482D, output 5V @ 2A for the PMU to use, but also for the two USB HOST Interface: USB1, USB2.
2. Battery-powered, input from the J2 connector. Such as single-cell support 4.1V/4.15V/4.2V/4.36V lithium batteries (lithium ion or lithium polymer). The default target battery voltage (Vtrgt) 4.2V, Automatic recharge voltage (Vtrgt-0.1) V. Vtrgt set by PMU registers.
3. USB power input, the input from a P2 USB OTG Interface 5V power supply.

USB power socket

Battery socket

12V power connector

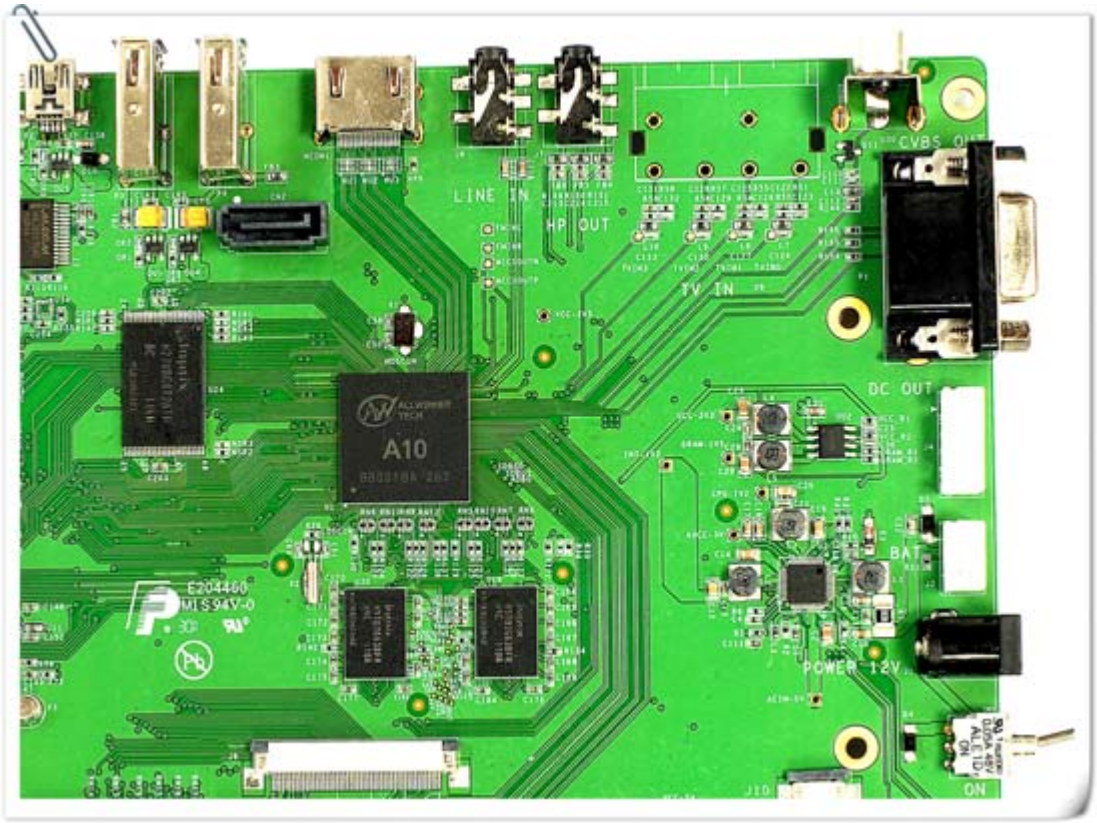
12V power switch



1.15.2 Power Output

From the J12 socket output DC 12V, DC 5V, DC 3.3V, GND. For user extensions.

Power outlet



1.15.3 PMU

PMU choices are highly integrated power system management chip AXP209, which integrates an adaptive PWM charger's USB-Compatible, 2 step-down converter (Buck DC-DC Converter), 5 linear regulators (LDO), voltage / current / temperature multi-channel 12-Bit ADC, and 4-way configurable GPIO. In order to ensure power system security and stability, AXP209 also incorporates over / under voltage (OVP / UVP), over temperature (OTP), overcurrent (OCP) and other protective circuits.

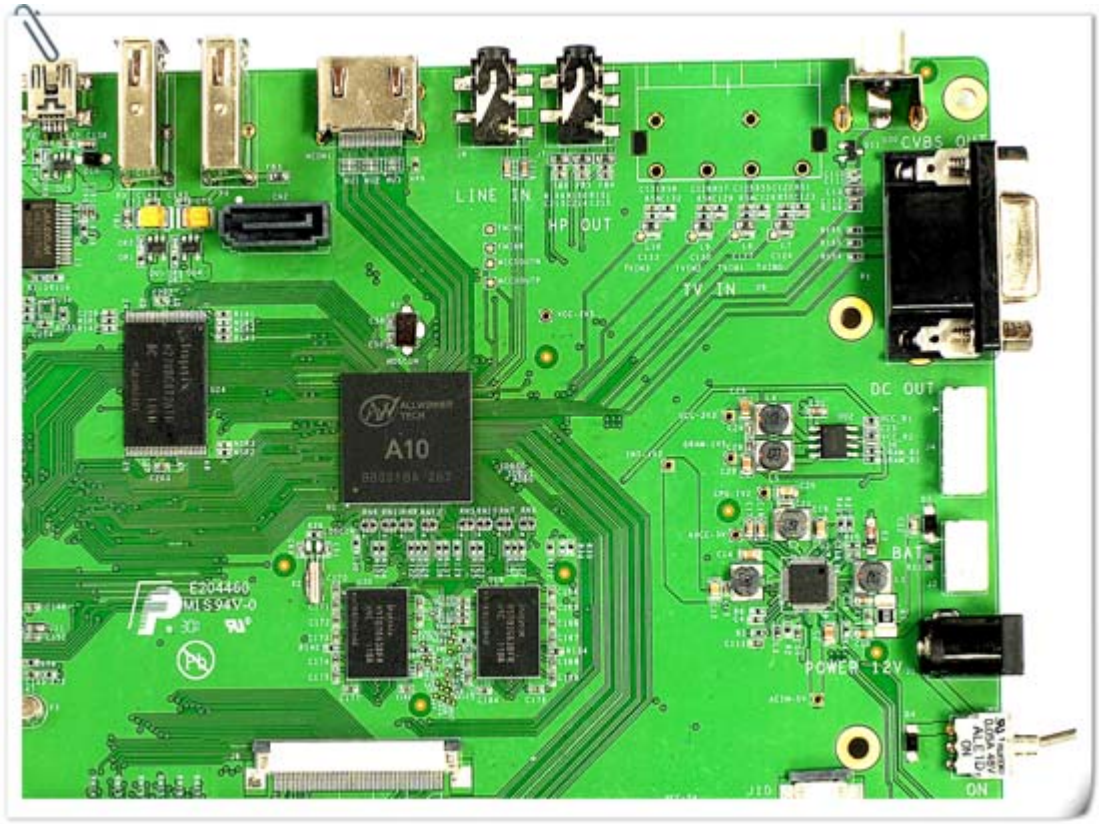
AXP209 provides a two-wire serial communication interface: Two Wire Interface (TWI), the application processor can use this interface to turn on or off certain power output, the voltage set them to access the internal registers and a variety of measurement data (including Fuel Gauge). High accuracy (1%, mainly by the 1% precision resistors BIAS decision) to facilitate measurement of electricity consumers to grasp more clearly the real-time energy usage.

AXP209 intelligent energy balance (Intelligent Power Select, IPSTM) circuit in the USB, and external AC adapter, battery and load application transparent distribution of power between the safety and the only external input power without the battery (or battery discharge / damage) in the case also allows applications to work properly. The specific energy distribution as follows:

- When the only access to lithium batteries, no external power input (VBUS or ACIN), the use of lithium-powered;
- When an external supply (VBUS or ACIN), preferred to use an external power supply;
- The case of the battery connection, external power supply is removed, immediately "seamless" switches to battery power supply;

- When VBUS and ACIN both access, the priority ACIN power, and to charge the lithium battery;
- If not enough ACIN drive capability, it will open the VBUS timely access, to achieve ACIN / VBUS common power supply;
- If the drive capacity is still insufficient, it will reduce the charge current up to 0, then added with the battery power supply;

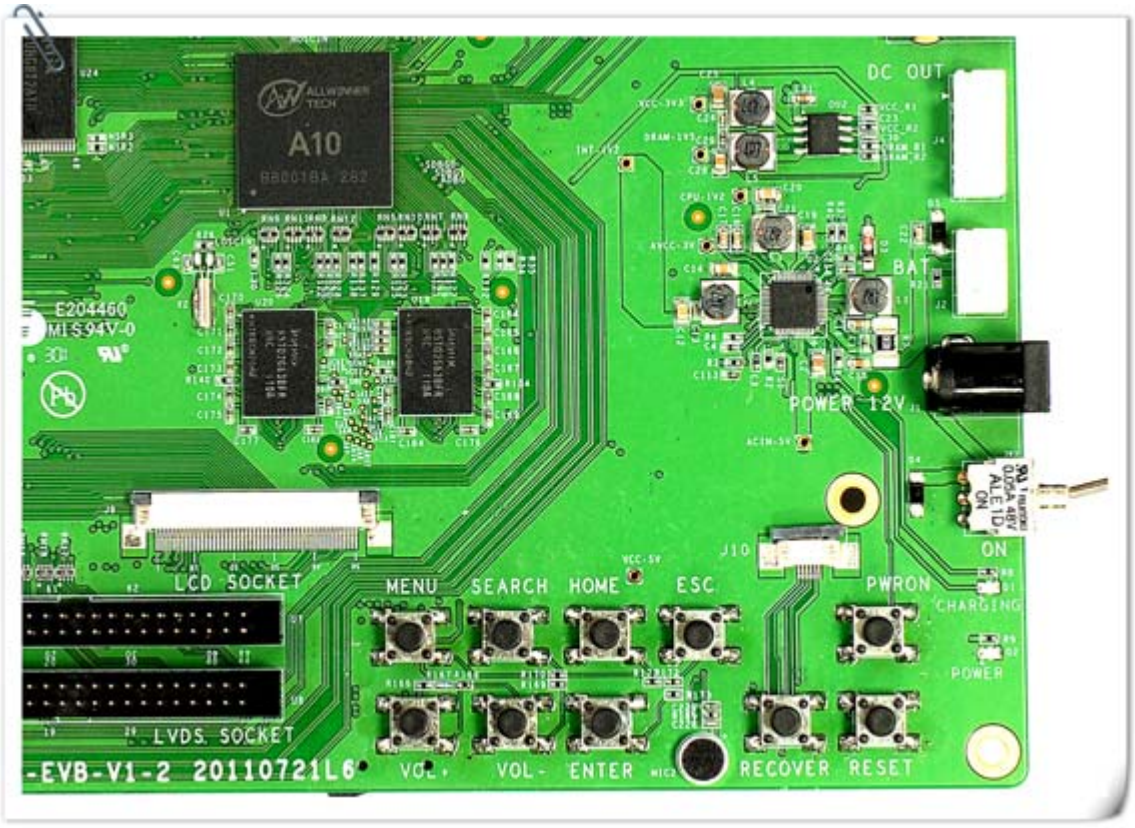
AXP209



1.15.4 Power LED D2

PMU works, the power light is light D2; otherwise off the power indicator D2.

Power LED D2

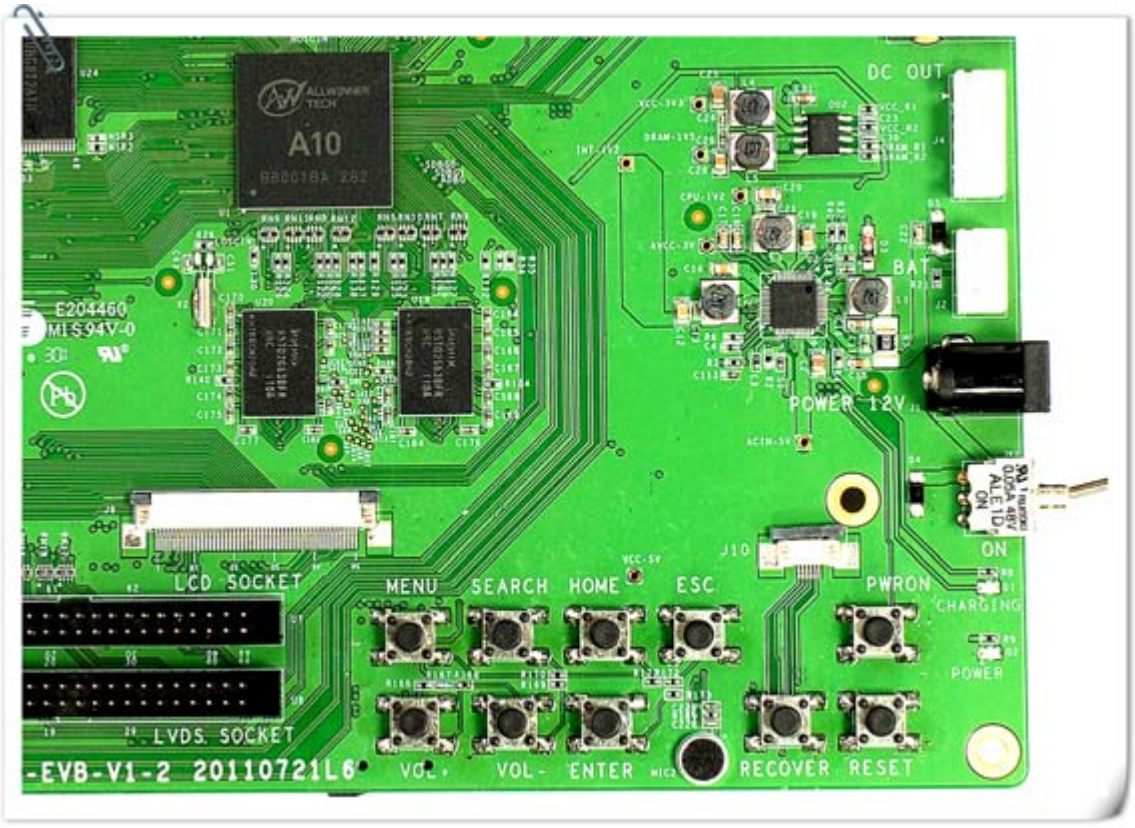


1.15.5 Charge status and alarm indicator D1

D1 indicates charging status indicator and alarm, which indicates that four states: charging, not charging, battery and external power supply abnormal overvoltage alarm alarm. As follows:

LED status	Note
Steady	Charging
Off	Not charging
Flashes at 1Hz	Battery usage or the charge level into the battery is too low
Flashes at 4Hz frequency	PMU input voltage is too high

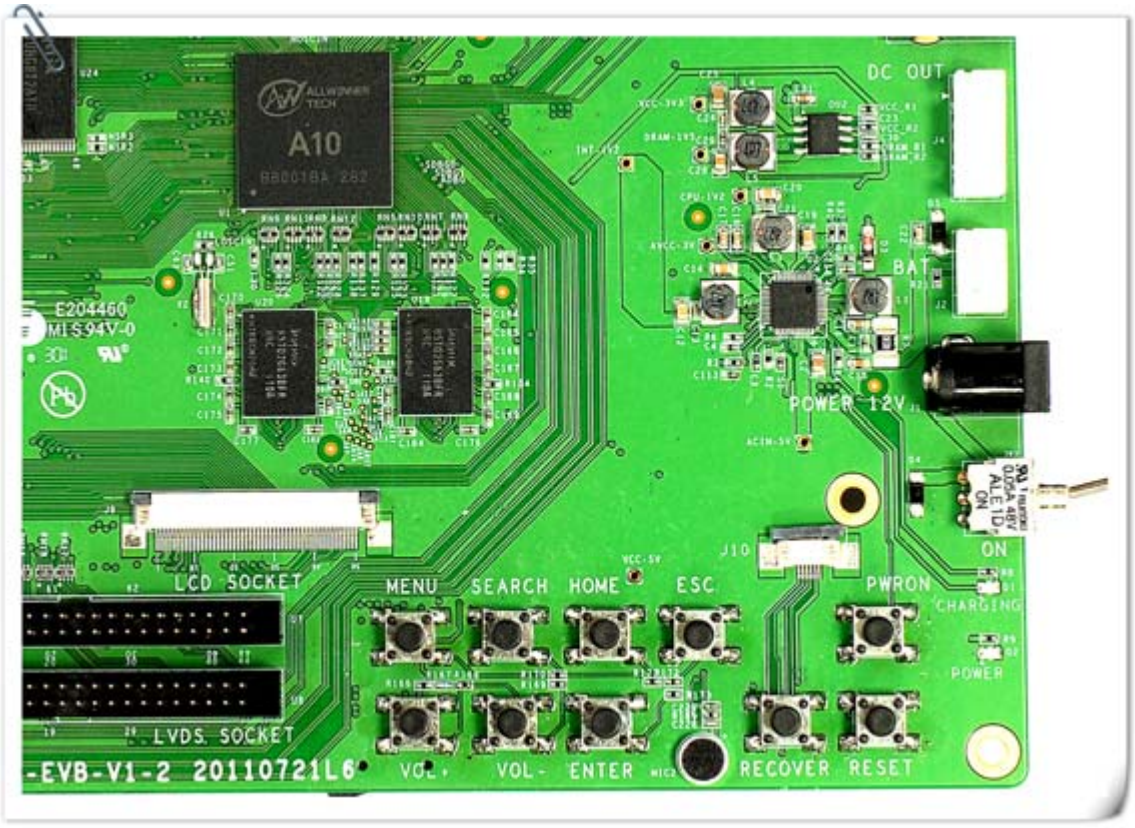
Charge status and alarm indicator



1.15.6 Reset button

Development board provides a reset button, the development board can be reset.

Reset button



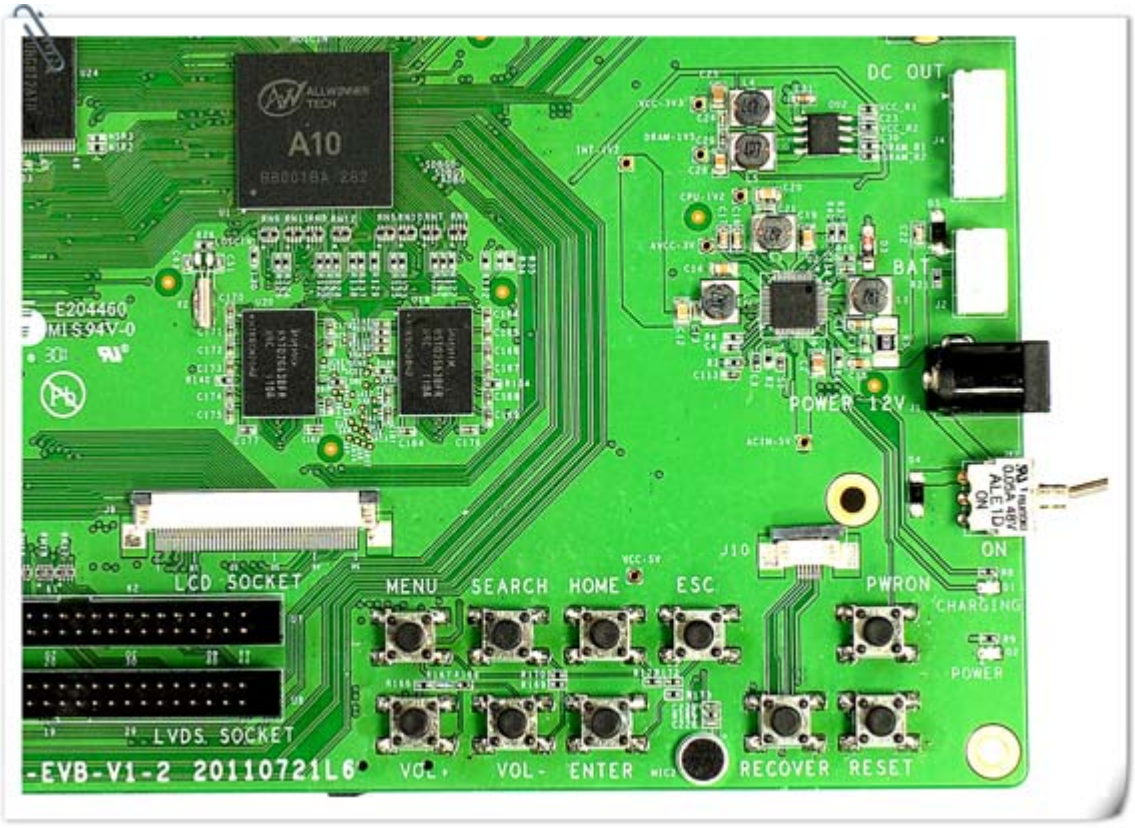
1.15.7 power soft-switching button

Development board provides a soft power switch button, connected to the PMU POWON signal.

By default, press (6 seconds) to achieve the power output of all PMU (RTC power LDO1 excluded) of the switch.

PMU can identify this button "press" and "Press" and send to the CPU IRQ, so users can customize the "long press" and "press" the button application. Specifically refer to the AXP209 Datesheet.

Soft power switch button

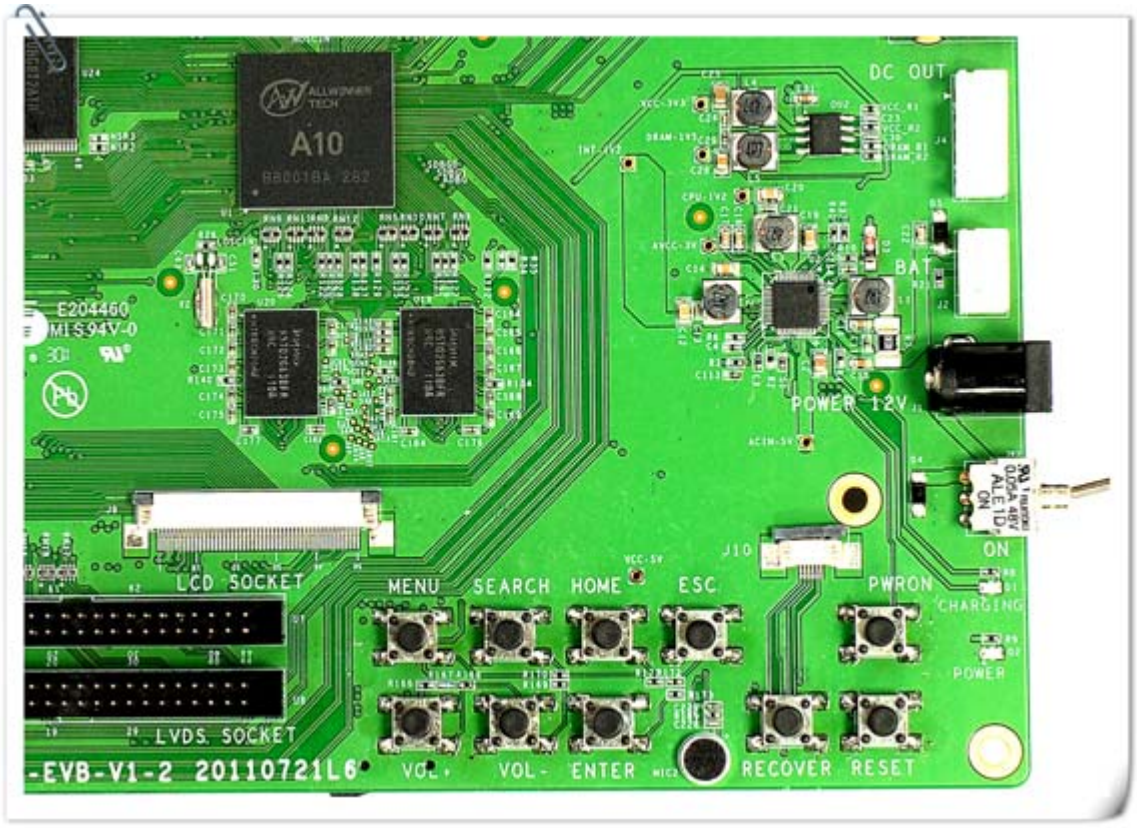


1.16 DRAM

Use the four 2G Bit 16 位 DDR3, constitute 32 1024M Bytes DRAM. Ensure the system's high-speed operation.

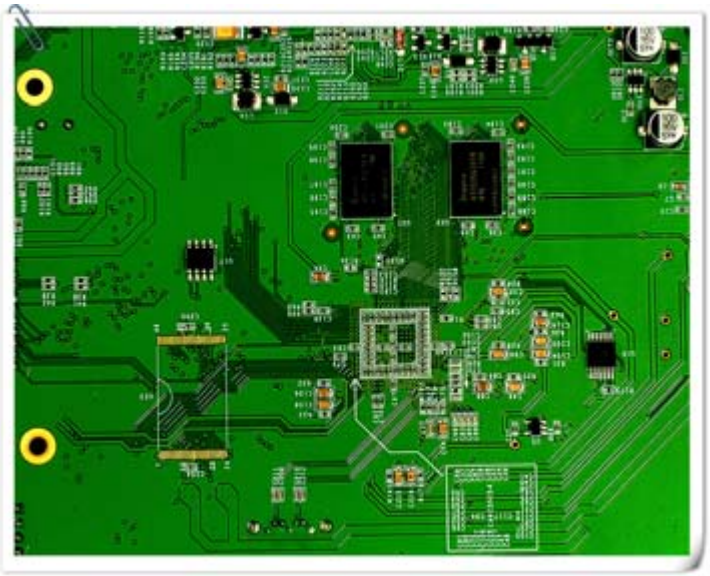
Frontal two

2GBit DDR3



The back two

2GBit DDR3



1.17 Boot Device

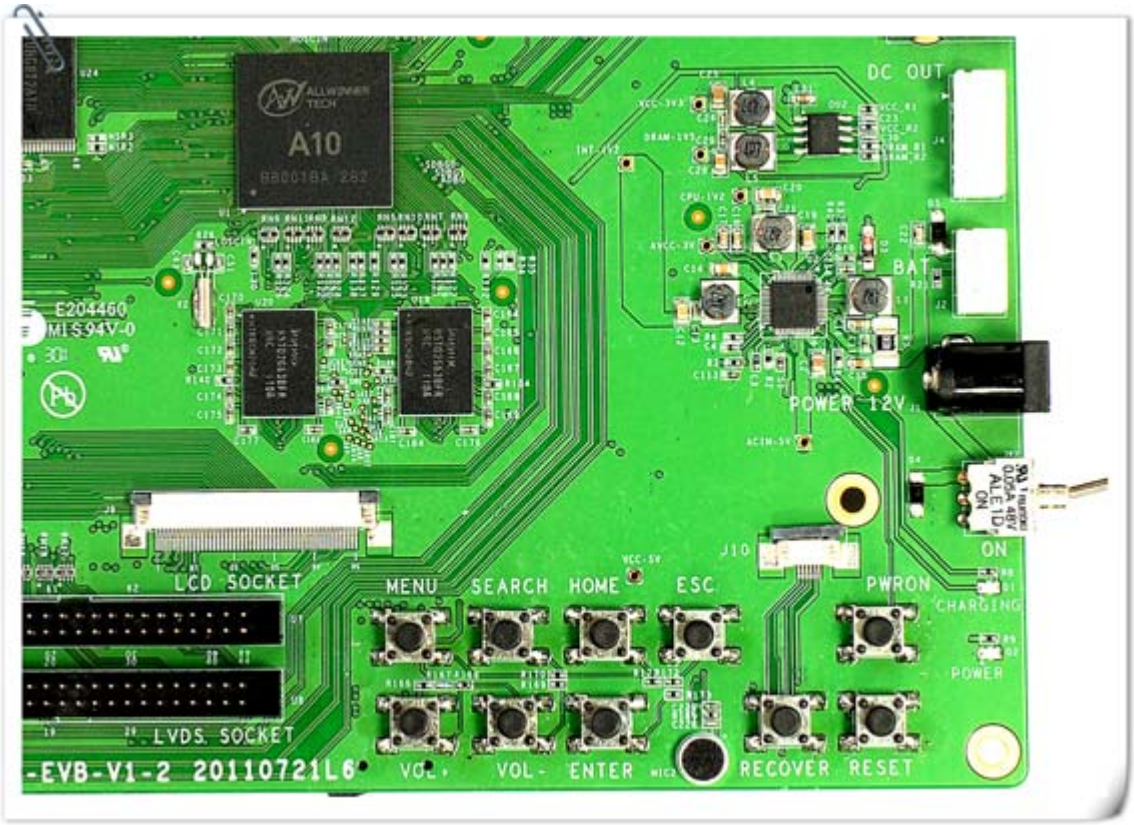
1.17.1 RECOVER Button

A10 development board provides the RECOVER button, the system can be used to select or start a key upgrade.

A10 and it can support multiple device boot, when the system power or reset button is pressed first check RECOVER, if RECOVER button not pressed, the system first from the SD / MMC card (U26) to boot the system, failed to guide from the NAND Flash system, NAND Flash boot failure from USB0 download firmware.

If you hold down the RECOVER button, the system skips all the boot device, download the firmware from USB0.

RECOVER Button

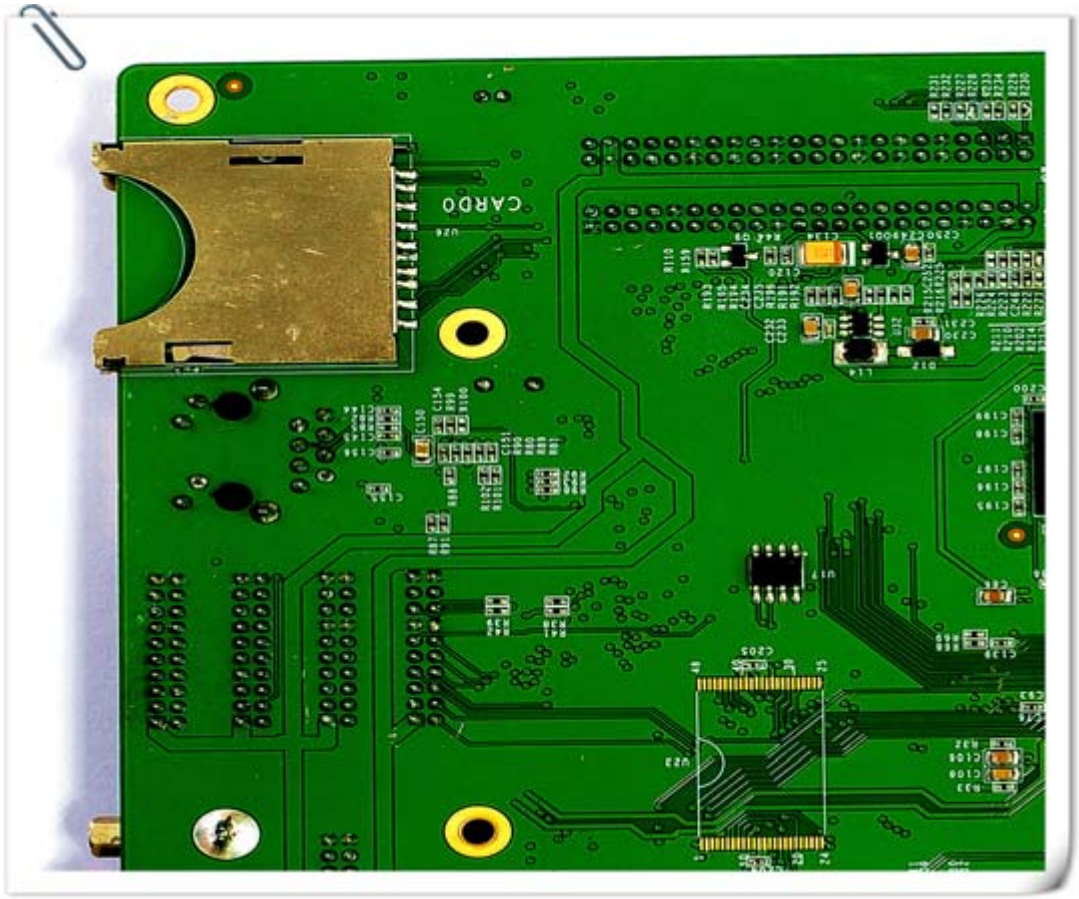


1.17.2 SD/MMC card socket

Development board provides an SD / MMC card interface, the SD CARD0 using the A10 interface. Its characteristics are as follows:

- Support SD / MMC card reader. Compatible with Secure Digital memory (up to SD3.0), Secure Digital I / O, Multimedia Card (up to MMC4.3).
- Memory card can support up to 32G.
- Provide 3.3V voltage, providing card detection (interrupt IO).

SD / MMC card socket (Card0)



1.17.3 NAND Flash

Development board equipped with a Hynix H27UBG8T2ATB, 4G Bytes MLC 64bit ECC NAND Flash. Use the four CE signal and 2 RB signal.

Board also set aside a NAND Flash location. Supports up to two single or two pairs of selected chip select NAND. Maximum capacity to support 16G.

4G NAND Flash

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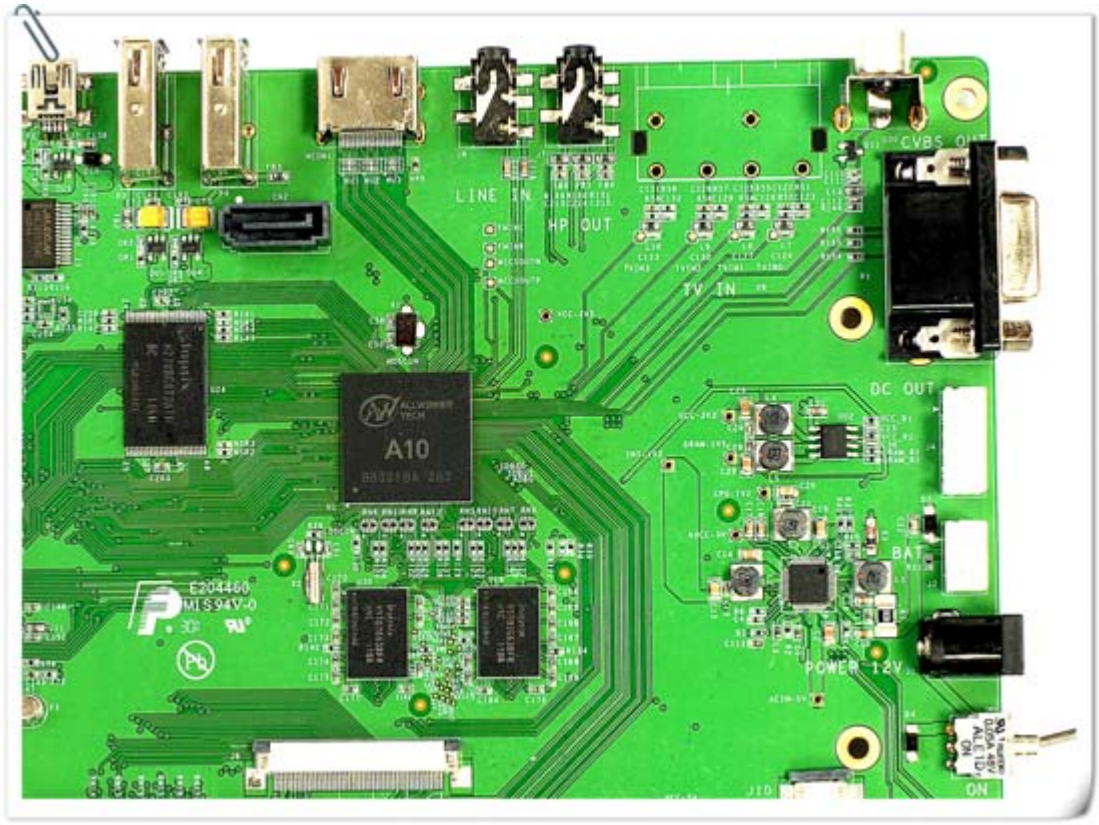
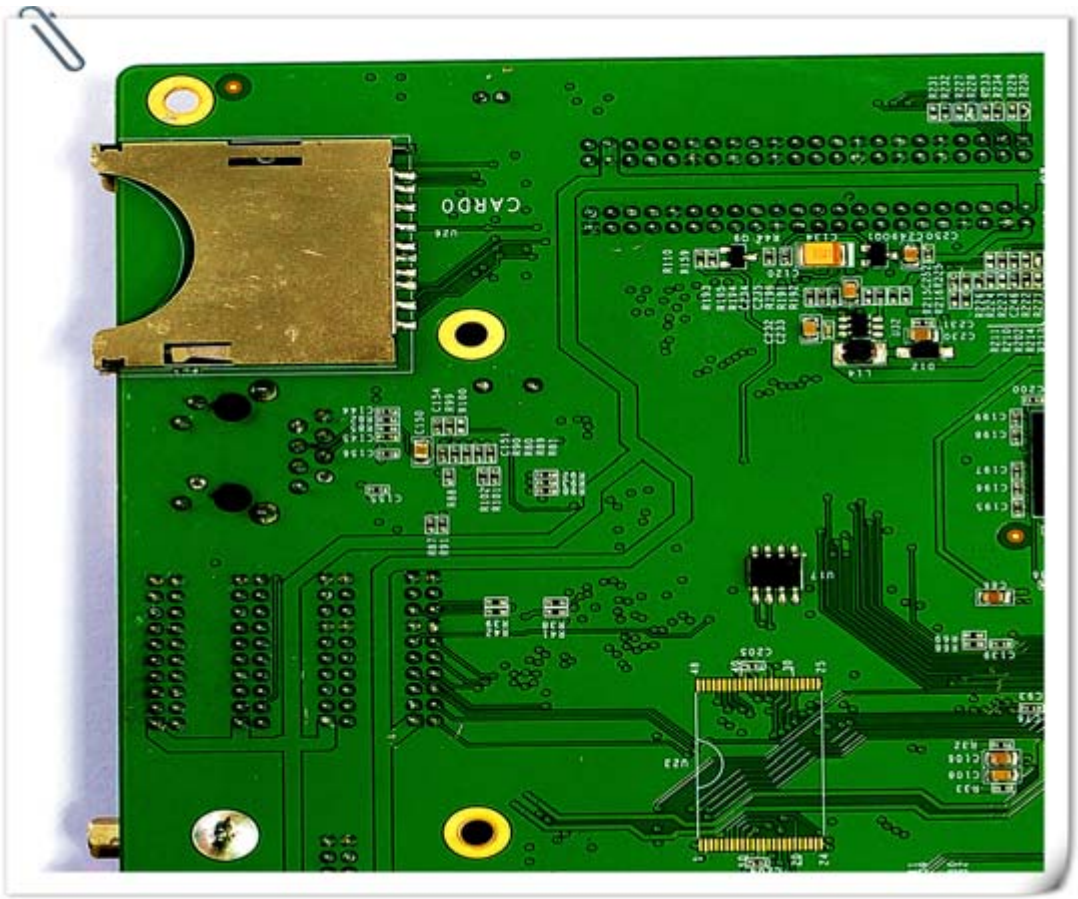


Location reserved for NAND Flash

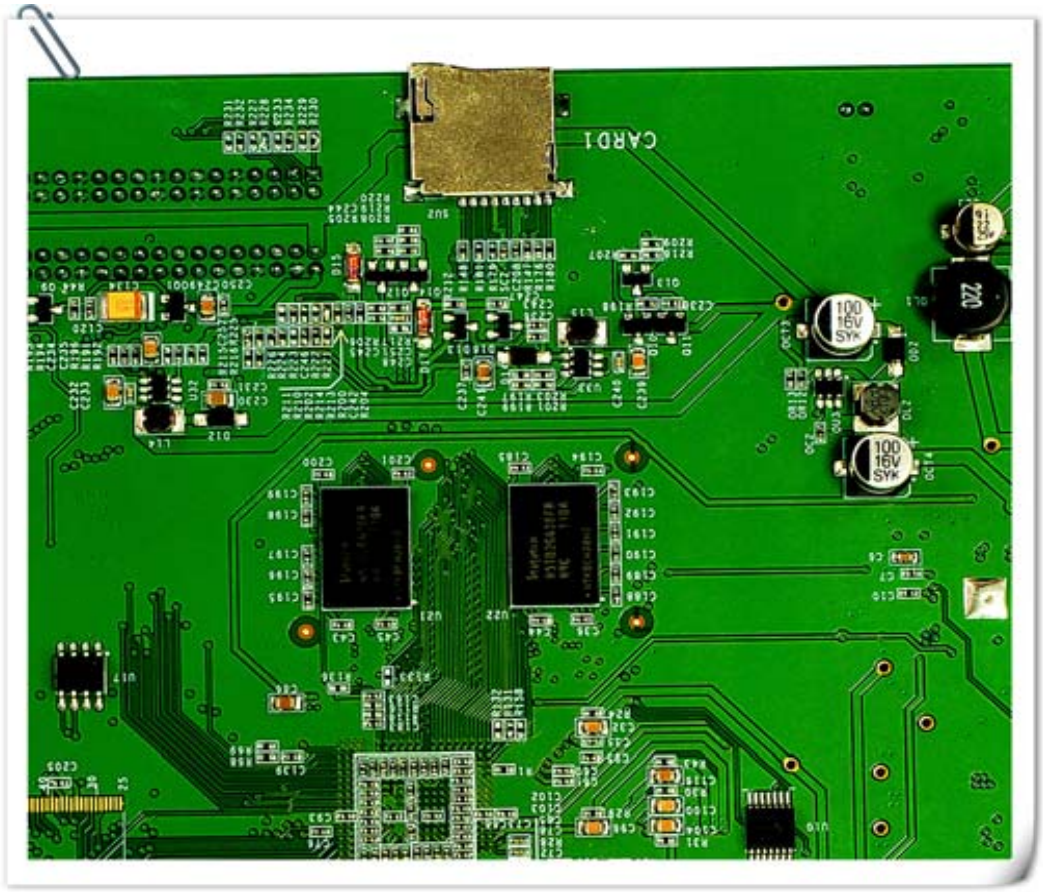


1.18 TF card socket

Development board provides an interface to TF card, the SD CARD1 using the A10 interface. Its characteristics are as follows:

- Support TF card reader, compatible with Secure Digital memory (up to SD3.0).
- Memory card can support up to 32G.
- Provide 3.3V voltage, providing card detection (interrupt IO).

TF card socket (Card1)

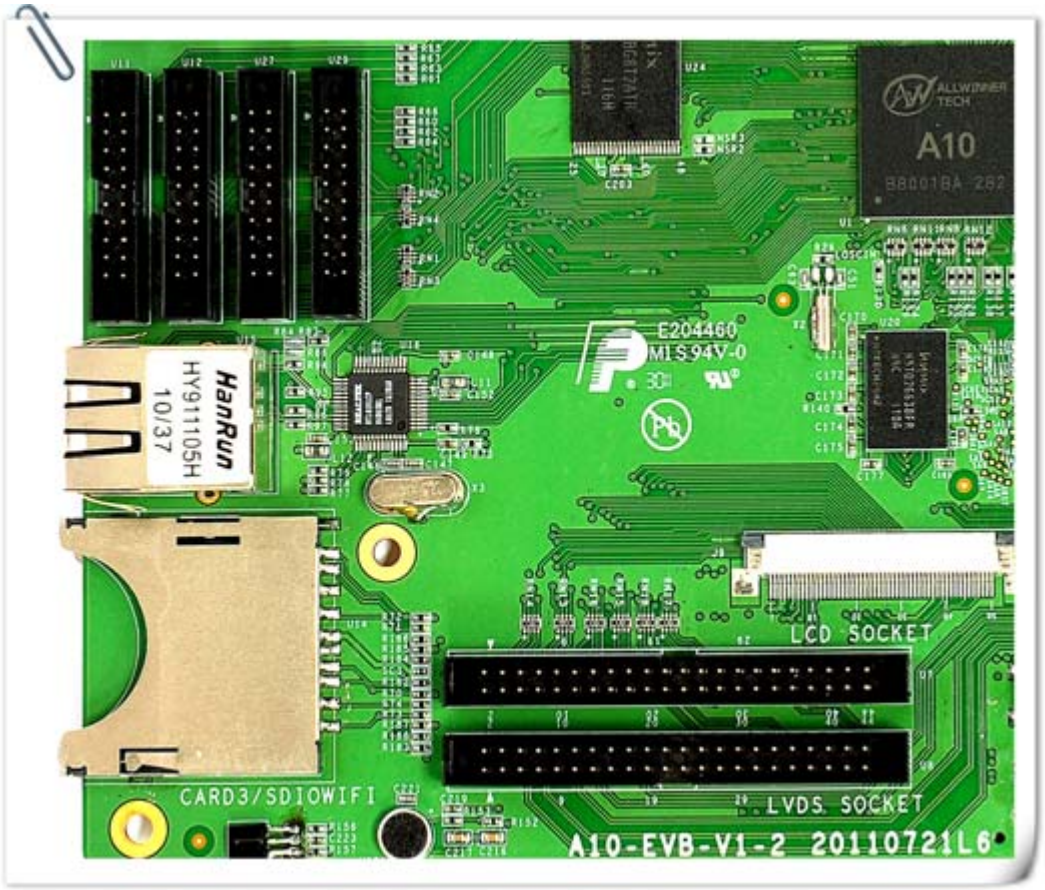


1.19 SDIO WIFI socket

Development board provides an SDIO WIFI card interface, the SD CARD3 using the A10 interface. Its characteristics are as follows:

- Developed primarily for SDIO WIFI card use. Support SDIO 1-bit and 4-bit interrupt mode; support suspend and resume operation; support read wait.
- Also available for SD / MMC card. Compatible with Secure Digital memory (up to SD3.0), Secure Digital I / O, Multimedia Card (up to MMC4.3).
- Memory card can support up to 32G.
- Provide 3.3V voltage, providing card detection (interrupt IO).

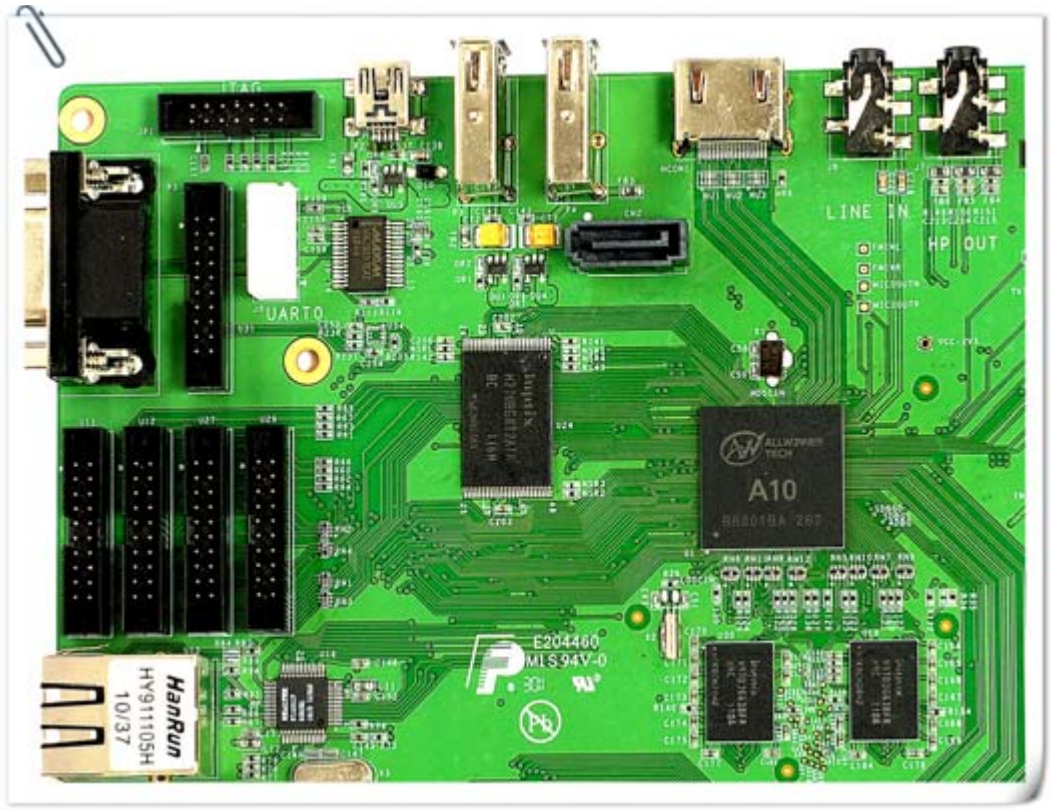
SDIO WIFI socket (Card3)



1.20 JTAG Interface

Standard JTAG debug interface offers 14pin 2.0mm IDC socket. User via the JTAG debug the system.

JTAG Interface



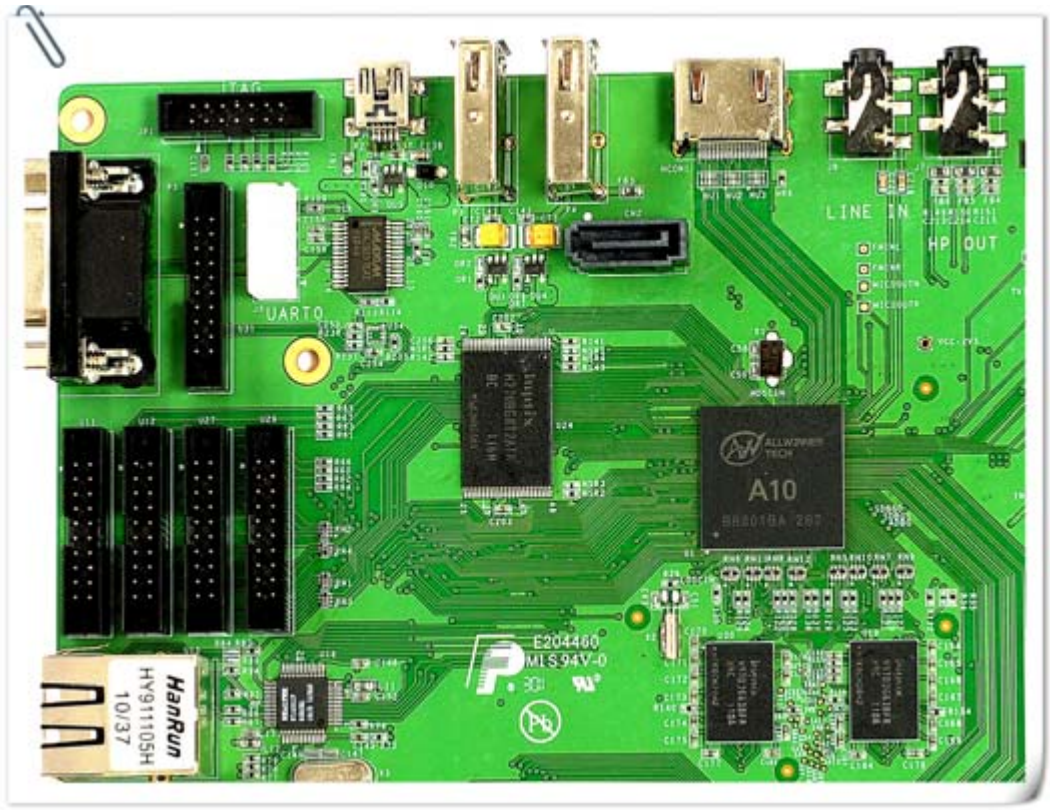
1.21 Ethernet

evelopment board provides network functionality, network interface chip REALTEK RTL8201CP chip. Its characteristics are as follows:

- Interface uses a Link / Active LED and isolation transformer RJ45 socket.
- Compatible with IEEE802.3 standards, support full and half duplex operation.
- Support 10/100M data rate.

Network interface chip

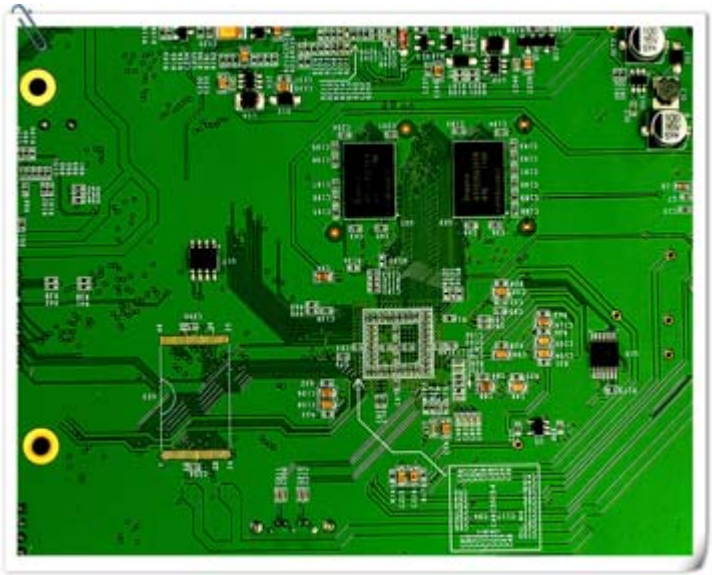
Ethernet RJ45 socket



1.22 EEPROM

Onboard a 2 Mbytes EEPROM AT24C16B, using the system TWI1 interface communication. MAC address can be used as storage or other applications.

2M Bytes EEPROM



1.23 USB OTG

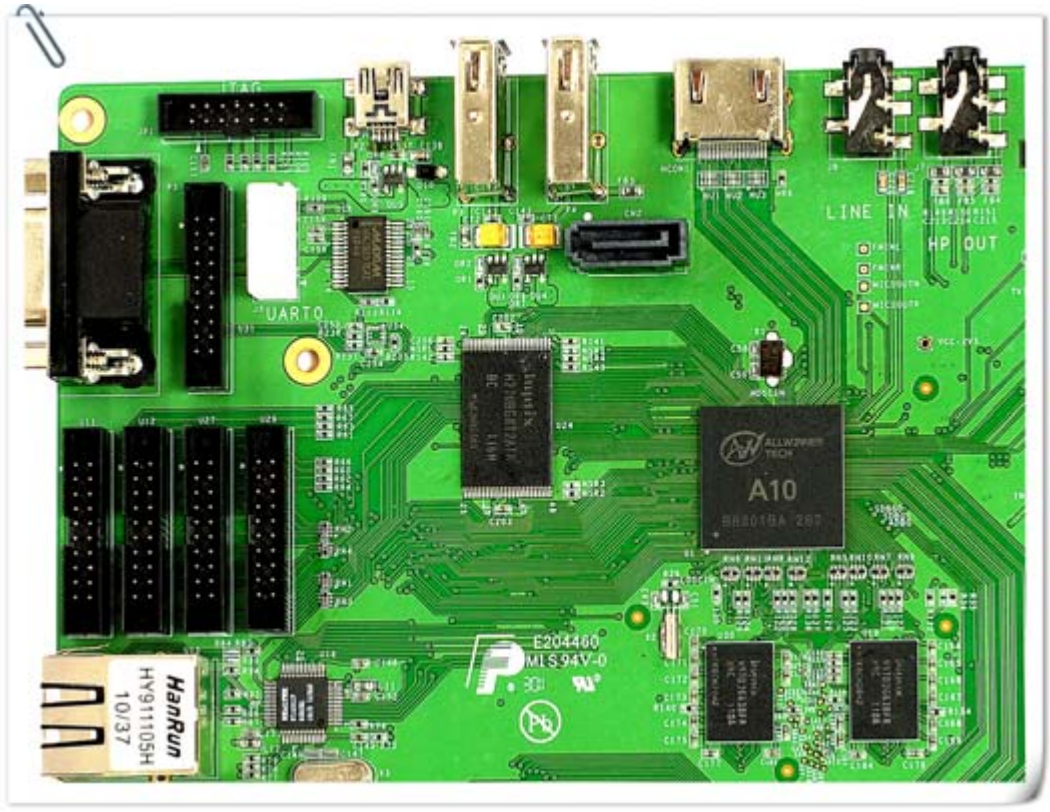
Development board provides a USB OTG interface, use the A10 USB0 interface. Its characteristics

are as follows:

- Fully compatible with USB OTG 2.0 specification.
- Can be configured as stand-alone USB HOST or USB DEVICE, fully compatible with USB 2.0 specification.
- Host mode can support high-speed (480-Mbps), full-speed (12-Mbps) and low-speed (1.5-Mbps) data transfer.
- Device mode can support high-speed (480-Mbps) and full-speed (12-Mbps) data transfer.
- Can detect VBUS insert, ID signal.
- Can enable the VBUS output, VBUS output current limiting 1A.
- Using a standard MINI-USB socket.

Socket number	Interface signals	VBUS output enable	VBUS detection	ID detection
P2	DM0/DP0(USB0)	GPIOB9	GPIOH5	GPIOH4

USB OTG (USB0)



1.24 USB HOST

Development board provides two USB HOST interfaces, respectively, using the A10 interface to the USB1 and USB2 interface. Its characteristics are as follows:

- Fully compatible with USB 2.0 specification.
- Able to support high-speed (480-Mbps), full-speed (12-Mbps) and low-speed (1.5-Mbps)

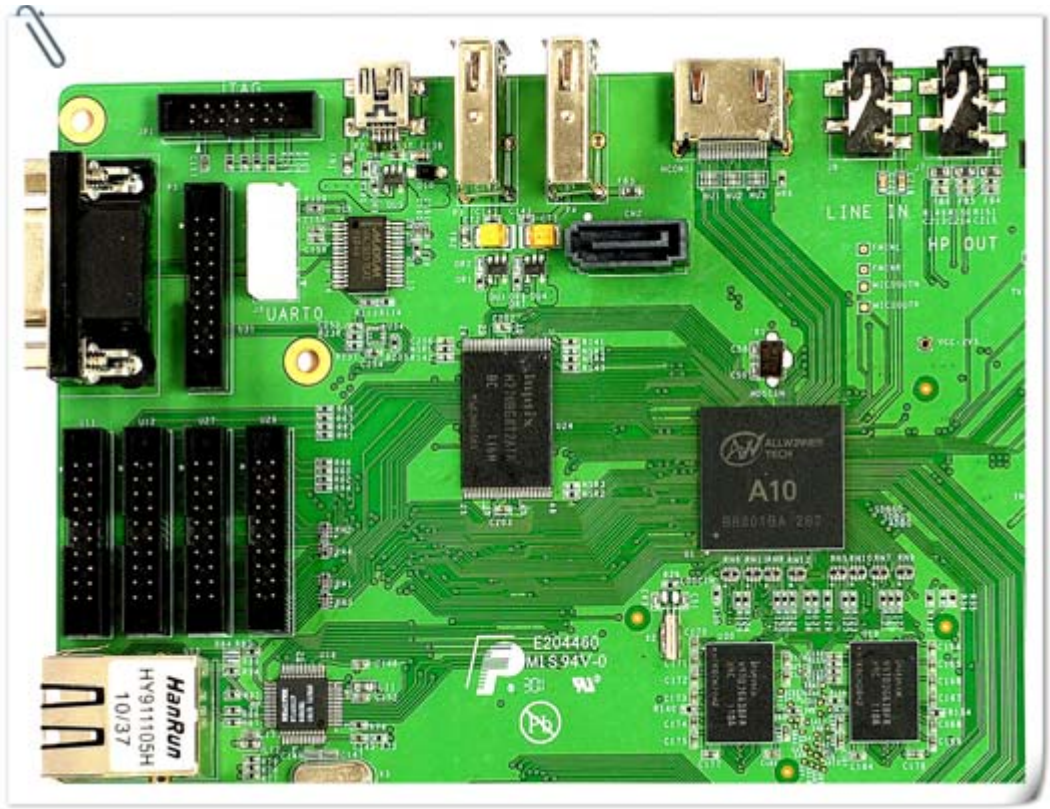
data transfer.

- Supplies VBUS output enable, respectively.
- Using a standard USB Type A socket.

Socket number	Interface signals	VBUS output enable
P3	DM1/DP1(USB1)	GPIOH6
P4	DM2/DP2(USB2)	GPIOH3

USB HOST (USB1)

USB HOST (USB2)



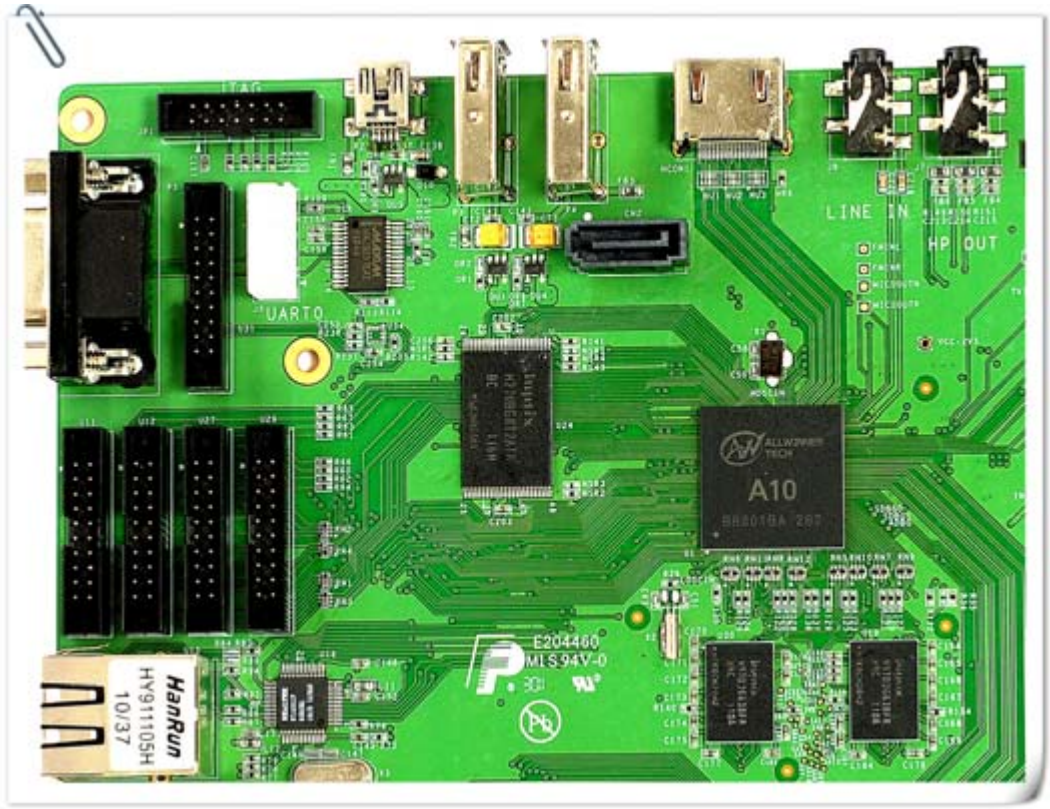
1.25 SATA

Development board to provide a SATA interface. Its characteristics are as follows:

- Supports SATA 1.5Gb/s, and SATA 3.0Gb/s
- Compliant with SATA Spec. 2.6, and AHCI Revision 1.3 Specifications
- Supports industry-standard AMBA High-Performance Bus (AHB) and it is fully compliant with the AMBA Specification, Revision 2.0. Supports 32-bit Little Endian
- OOB signaling detection and generation
- SATA 1.5Gb/s and SATA 3.0Gb/s speed negotiation when Tx OON signaling is selected
- Supports device hot-plugging
- Support power management features including automatic Partial to Slumber transition

- Internal DMA Engine for Command and Data Transactions
- Supports hardware-assisted Native Command Queuing (NCQ) for up to 32-entries
- Support external SATA (eSATA)

SATA connector



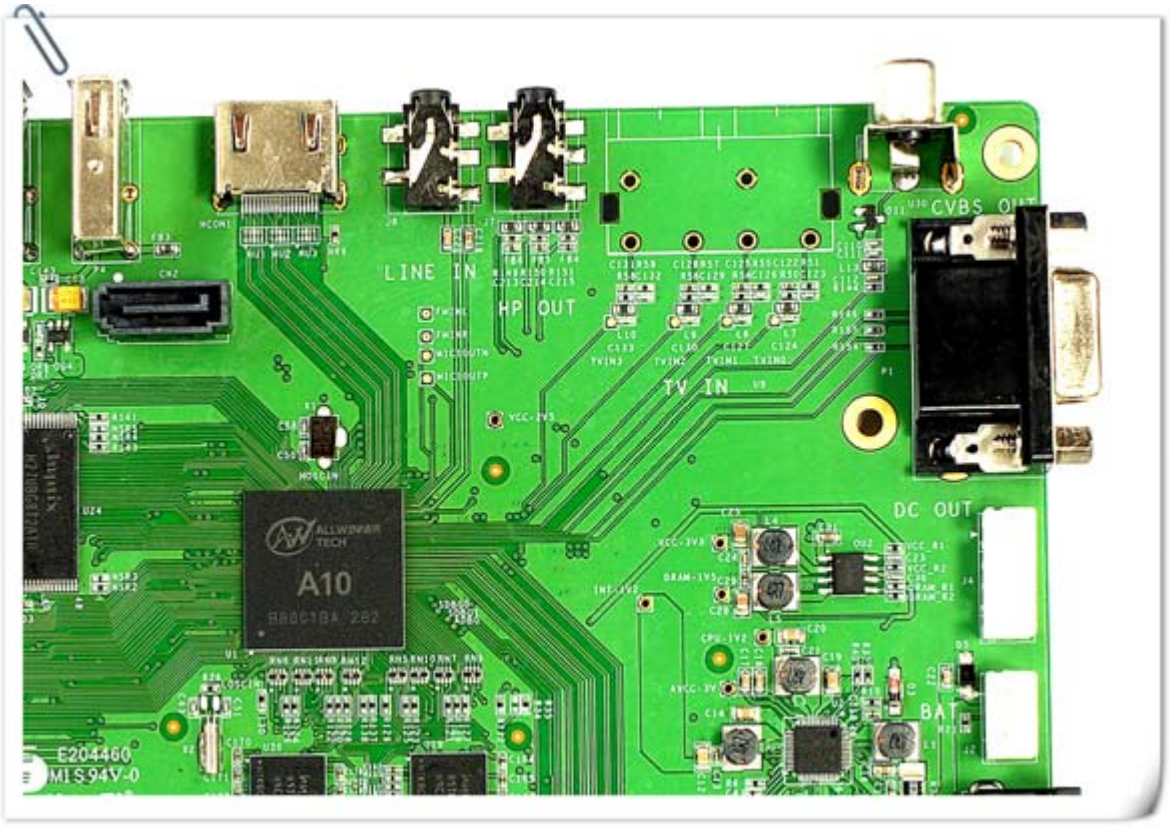
1.26 TV IN

Provides 3-way video input, support CCIR-656 4:2:2 8-bit parallel input format. Using Cinch.

1.27 CVBS OUT

Video CVBS output to provide a way to support 4 X12-bit DAC output data. Using Lotus jack for connecting TV and other equipment.

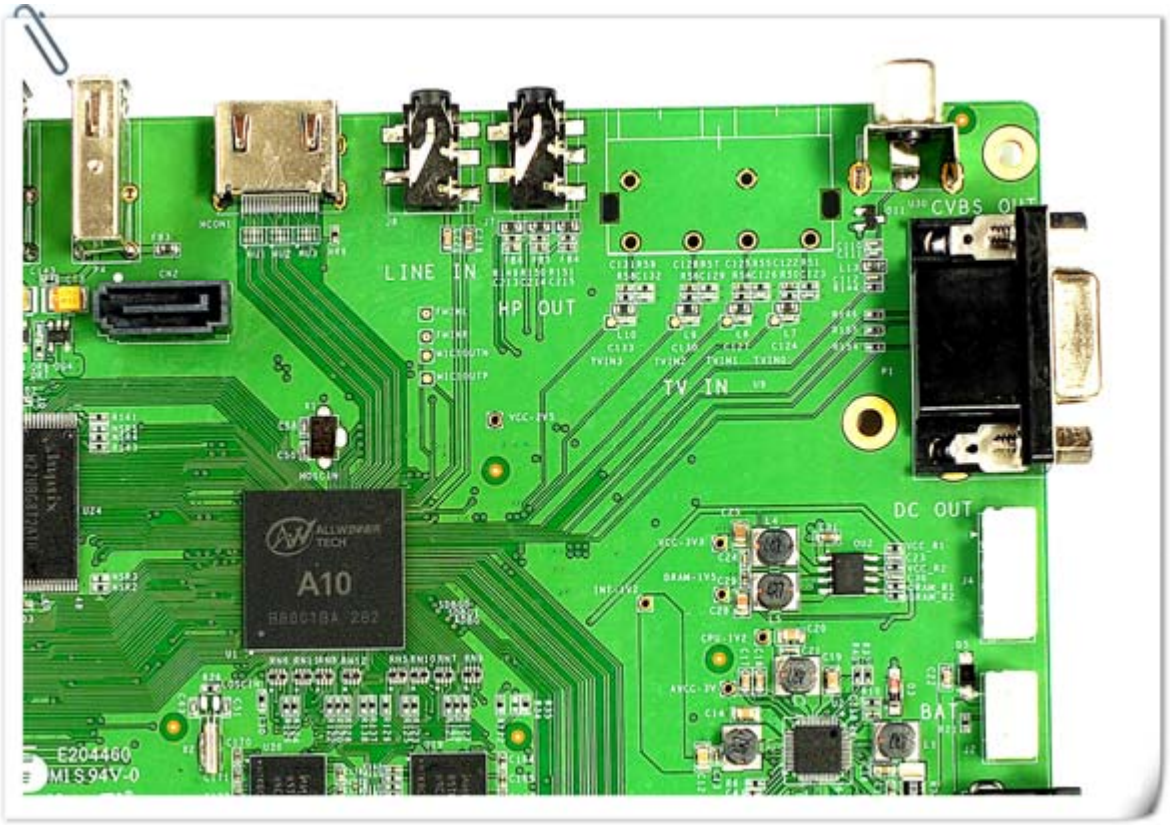
CVBS output socket



1.28 VGA OUT

VGA output support RGB. Support for 4 X12-bit DAC output data. Using DB15 socket, can be directly output to the computer monitor. Easy to use monitor for video development.

VGA output socket



1.29 TTL LCD

A10 LCD controller has the following features:

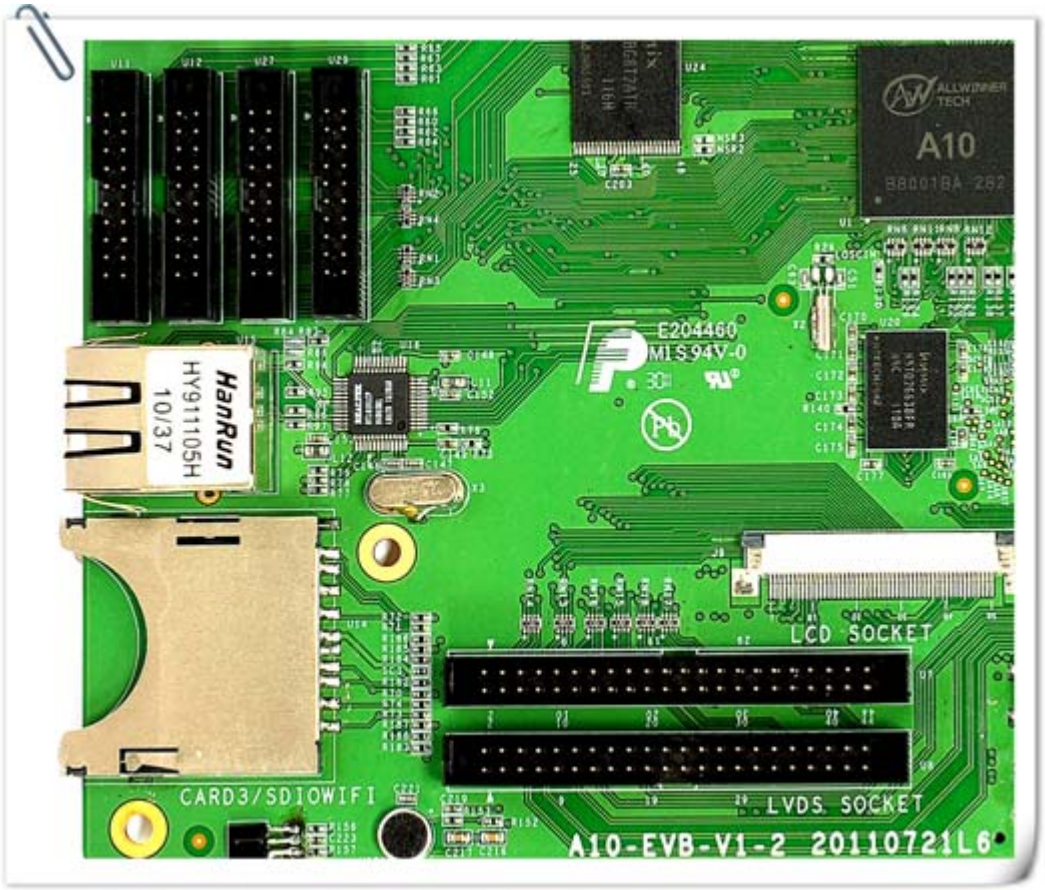
- Support the HV-DE-Sync (digital parallel RGB) input LCD panels (Max 1024 * 1024 resolution ,24-bit color).
- Support the HV-DE-Sync (digital serial RGB, both delta and stripe panel) input LCD panels (Max 680 * 1024 resolution, up to true color).
- Support TTL (digital RGB) input LCD panels (Max 1024 * 1024 resolution, 18-bit color).
- Support Analog RGB input LCD panels (Max 1024 * 1024 resolution, 3 channel 6bit DAC output).
- Support 18/16/9/8bit 8080 CPU I / F panels (Max 1024 * 1024 resolution).
- CCIR-656 output interface.

Onboard a 50pin FPC socket and plugs directly into supporting the 5-inch 800 * 480 high-definition LCD touch screen, or other TTL LCD support for development.

While providing a 44pin 2.0mm IDC expansion socket outlet as the LCD for users to develop other dimensions of LCD applications. Provide three GPIO Using as LCD control, a PWM as the backlight control. 3.3V and 5V power output. 3.3V power supply controlled by the GPIO off.

50pin LCD FPC

44pin 2.0mm LCD



1.30 LVDS LCD interfaces

Provides four LVDS outputs: 3 sets of data signals and a set of clock signals.

Provide three GPIO as LCD control, a PWM as backlight control.

3.3V and 5V power output. 3.3V power supply controlled by the GPIO off.

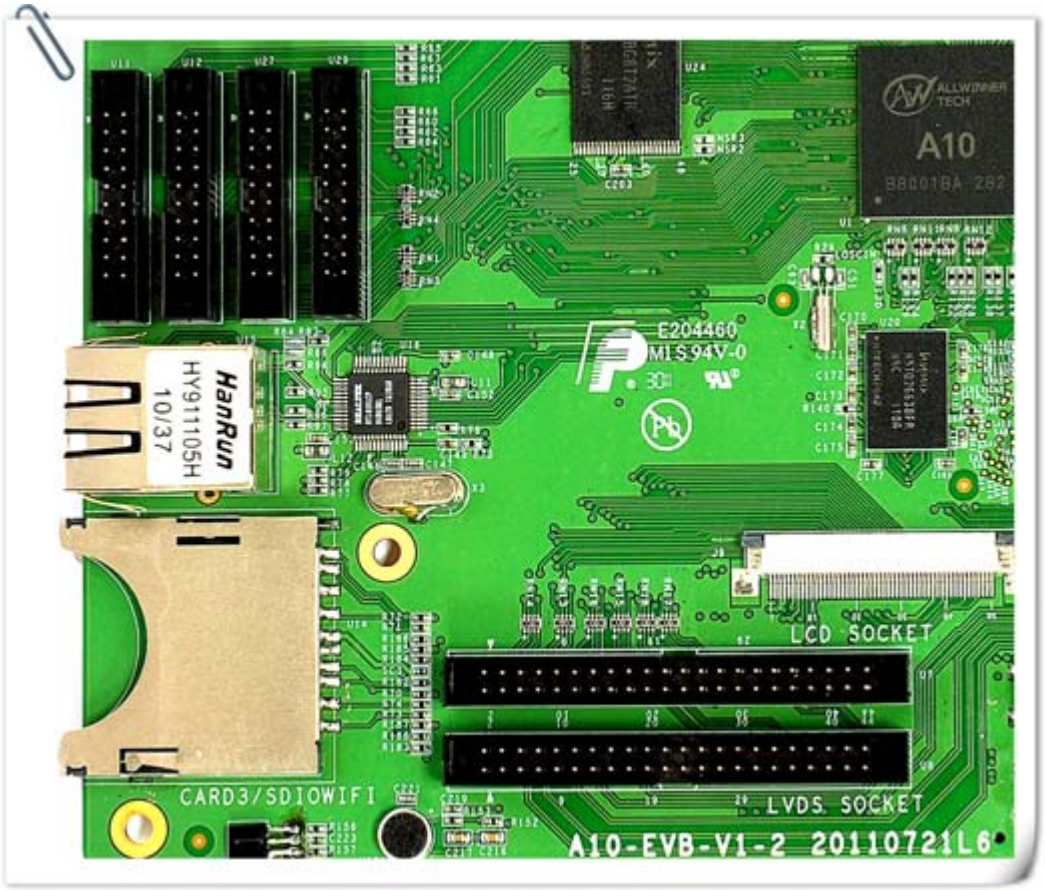
Provide four-wire resistive touch screen interface signals.

Using a 44pin 2.0mm IDC connector. Can insert the optional LVDS LCD module development.

Note:

- FPC connector J9, IDC sockets U7, IDC socket U8 multiplexing a signal, at the same time can only use one interface.
- VGA and TTL LCD common signal HSYNC and VSYNC, VGA and TTL LCD can not be used.

44pin 2.0mm LVDS LCD IDC



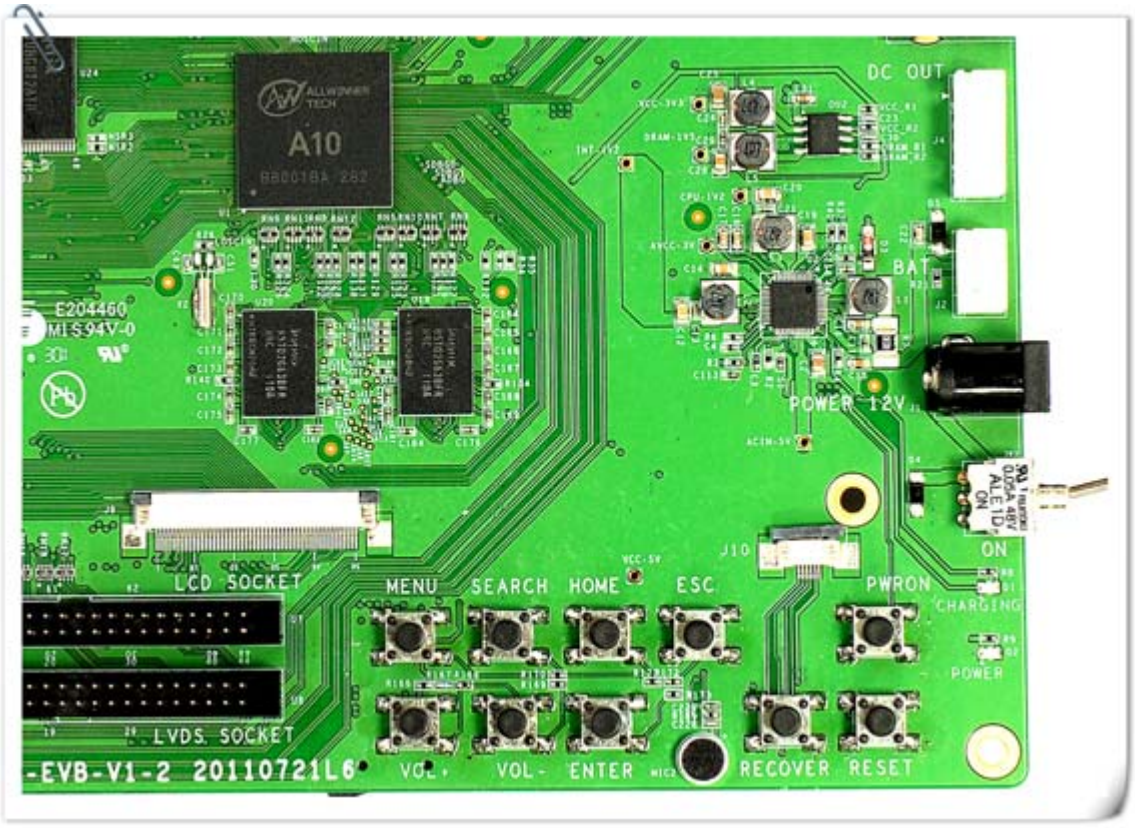
1.31 touch panel interface

A10 Touch Panel ADC has the following features:

- Support interrupts.
- 11-bit resolution.
- Input voltage range: 0V to 2/3AVCC (2.0V).
- Sampling rates up to 128K.
- Support the four-wire resistive touch screen.

TWI interface development board Able to support capacitive touch screen, Using the A10 TWI2 interface signals. provides a 4pin FPC, users can TTL LCD IDC or LVDS LCD IDC expansion capacitive touch screen interface.

4pin FPC capacitive panel interface

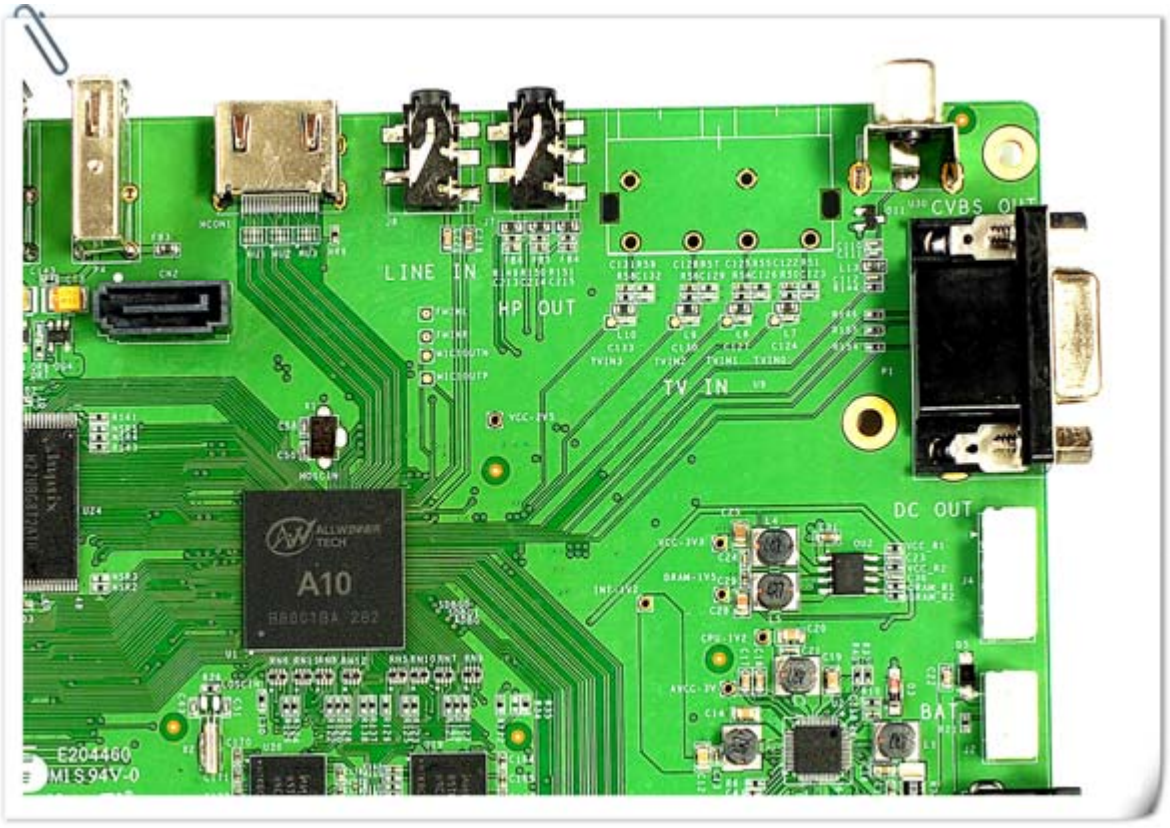


1.32 HDMI

A10 built-in HDMI interface, has the following features:

- HDMI V1.3 compliance
- Support Max 4K*4K resolution
- Support up to 165M pixel/second
- Support 480I/576I/480P/576P/720P/1080I/1080P at 24/25/30/50/50.9Hz
- Support 24/30/36/48-bit RGB data format,with 2X/4X repeater
- Support up to 8 channel,24bit PCM
- Support IEC61937 compress audio formats
- Support 1-bit audio
- Support HD audio
- Hardware Receiver active sense and Hot plug detect
- Interrupts for programmer

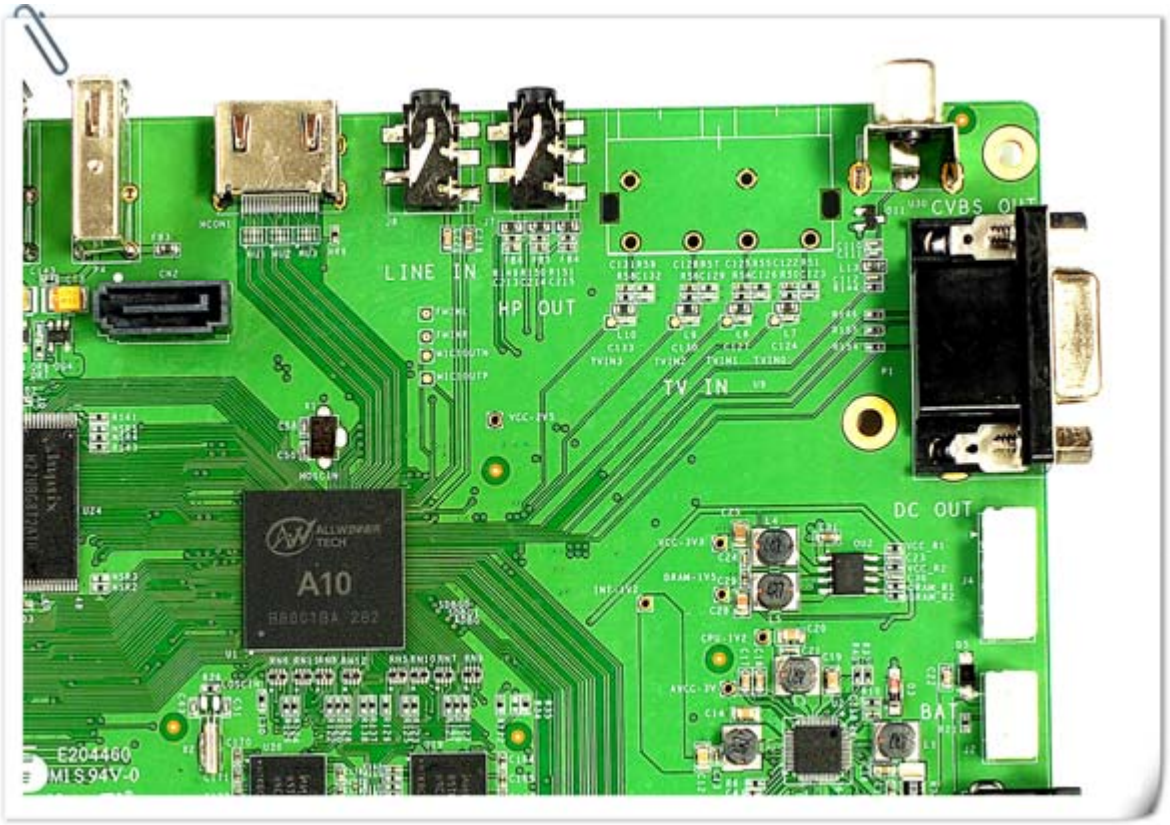
HDMI socket



1.33 Analog Audio Output

Development board provides two analog audio output with 3.5mm stereo headphone jack. Using DC coupling.

Audio output jack



1.34 Analog Audio Input

Development board provides two analog audio inputs, 3.5mm stereo headphone jack.

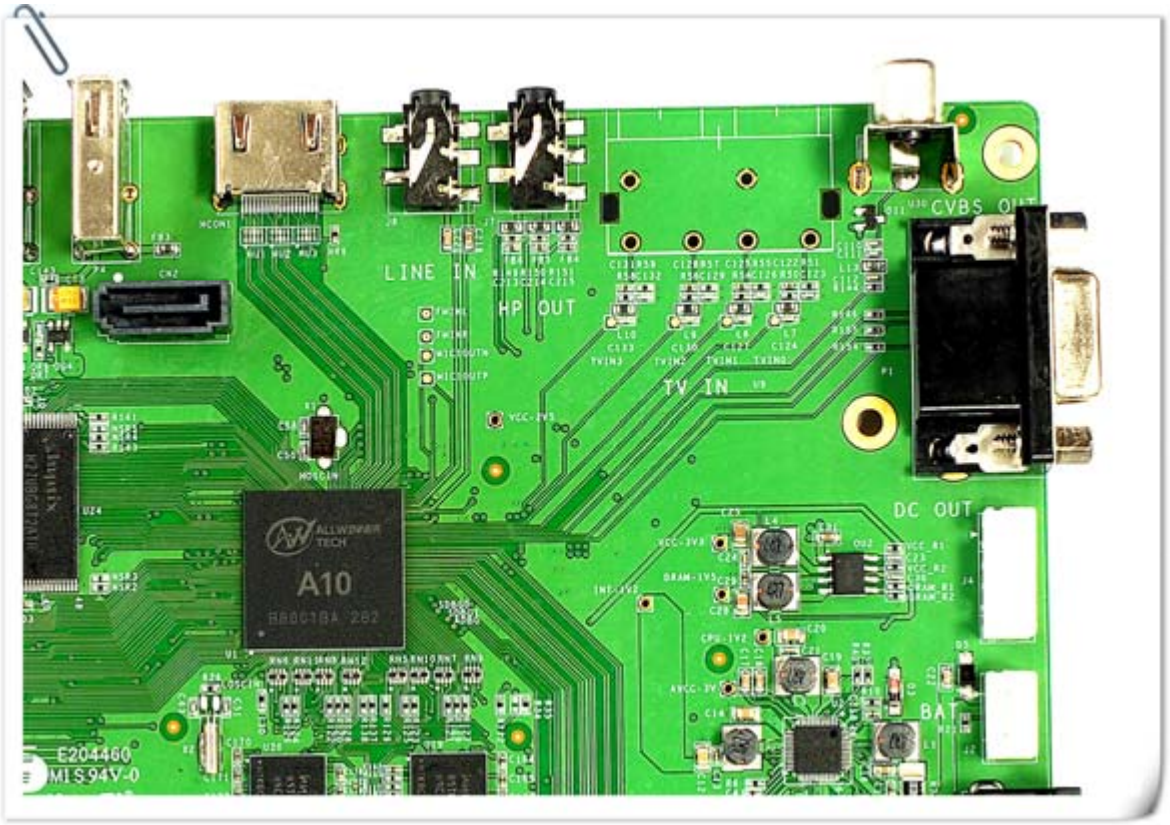
AC coupling.

24-bit DAC。

Support for 48K and 44.1K sampling rate

Support for 192K and 92K sampling.

Audio input jack



1.35 Microphone

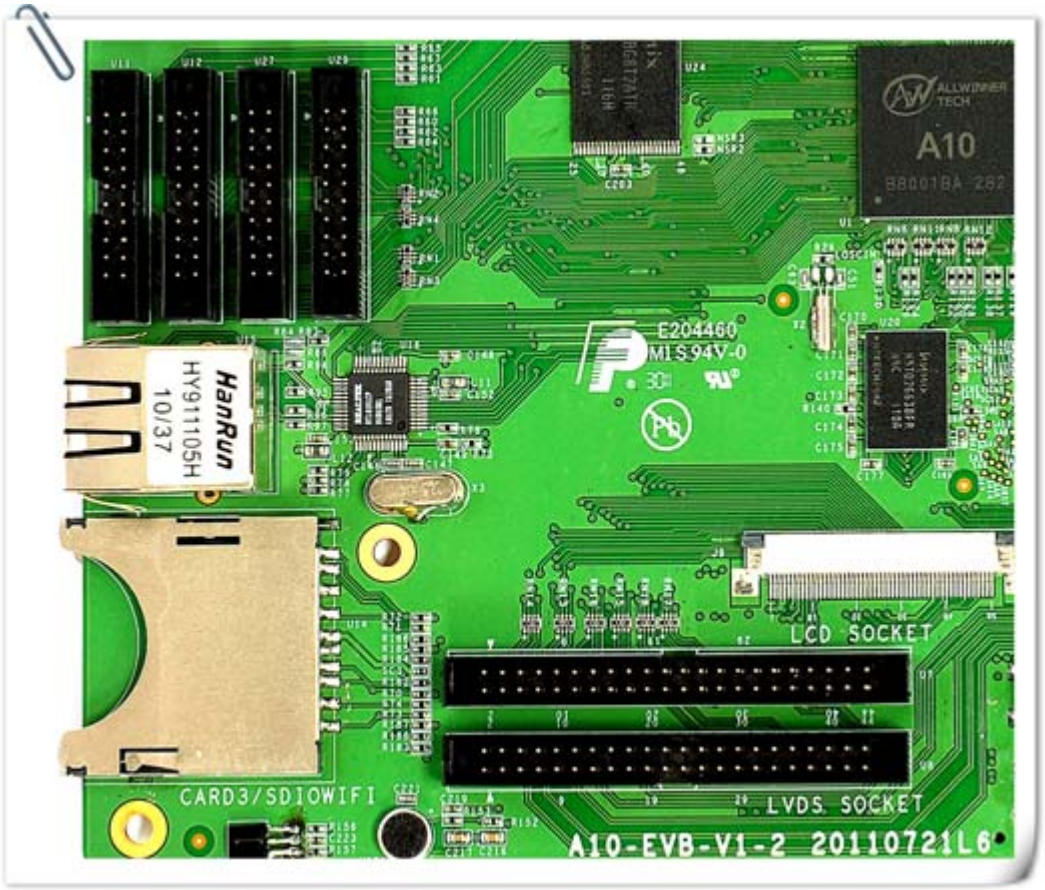
Onboard two-way Microphone, stereo recording can be done the development.

24-bit DAC。

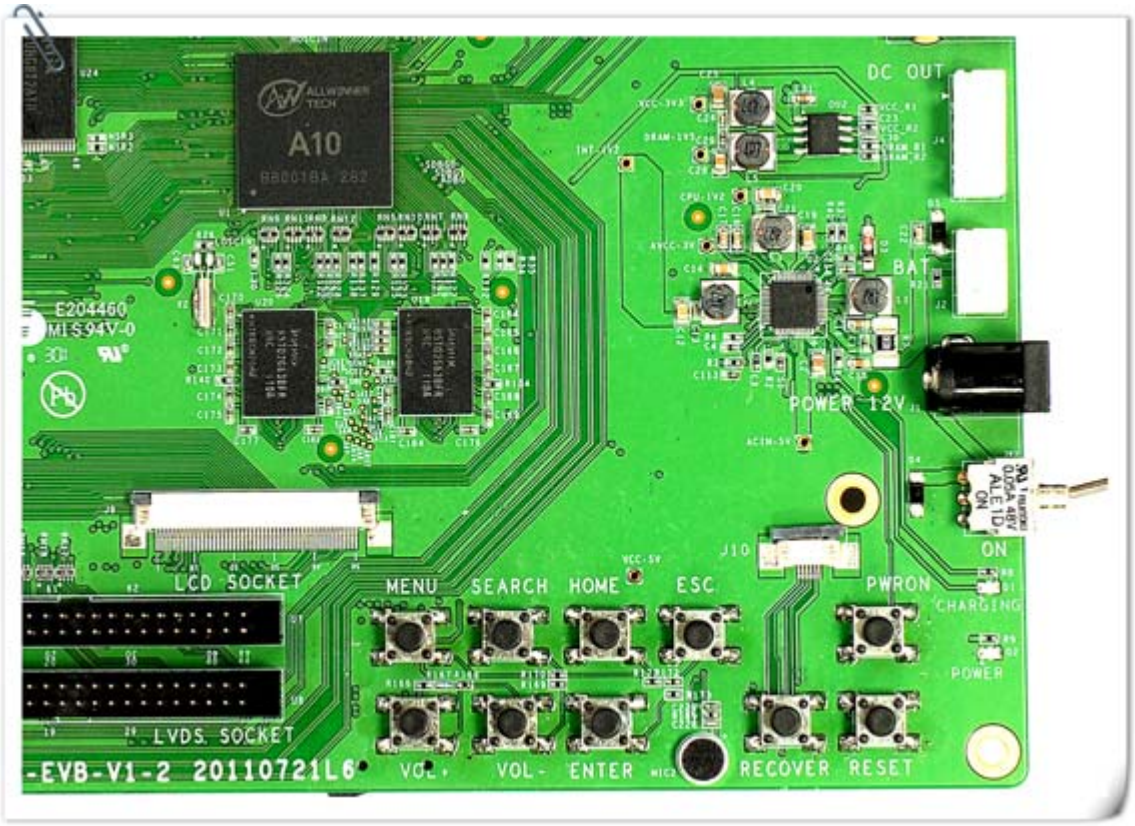
Support for 48K and 44.1K sampling rate

Support for 192K and 92K sampling.

Left Mic


A10
E204460
MIS94V-0
HanRun
HY911105H
10/37
LCD SOCKET
LVDS SOCKET
CARD3/SDIOWIFI
A10-EVB-V1-2 20110721L6

Right Mic


A10
E204460
MIS94V-0
DC OUT
BAT
POWER 12V
ON
PWRON
CHARGING
POWER
LCD SOCKET
LVDS SOCKET
MENU
SEARCH
HOME
ESC
VOL+
VOL-
ENTER
RECOVER
RESET
-EVB-V1-2 20110721L6

1.36 User keys & LRADC

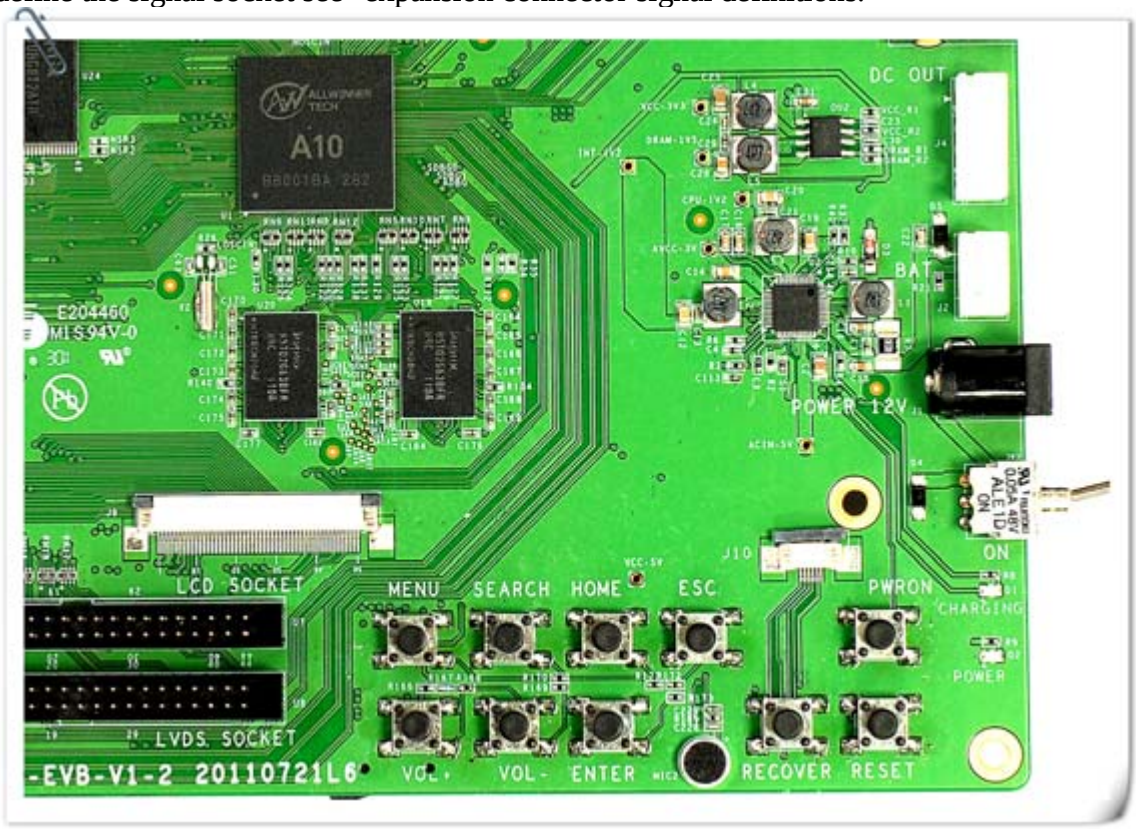
A10 provides a two-way Low Resolution ADC input (LRADC0, LRADC1), as a key application. Its characteristics are as follows:

- Support interrupts.
- 6-bit resolution.
- Voltage input range 0 to 0.67 * AVCC (AVCC is LRADC reference voltage).
- Sampling rates up to 250HZ.

LRADC0 is connected to the development board, predefined commonly used for the ANDRIOD's seven buttons: VOL +, VOL-, MENU, SEARCH, HOME, ESC, ENTER. Users can also customize the button functions.

A10 also provides RECOVER button can be used as a key boot options or upgrades. See Boot Device.

LRADC1 for user extensions. IDC socket for the user in the form of expansion and development to define the signal socket see "expansion connector signal definitions."



1.37 Infrared Transceiver Interface

A10 were provided along the way IR-RX and IR-TX. Its characteristics are as follows:

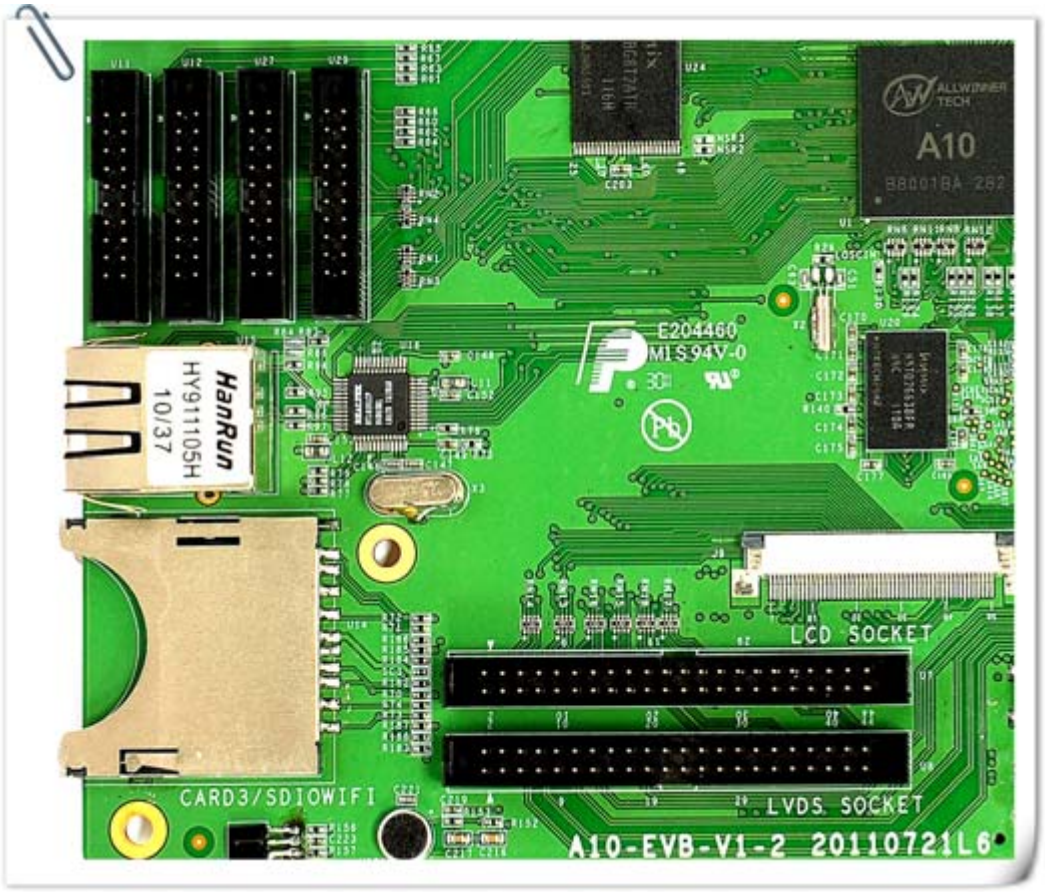
- Compatible with MIR FIR IrDA 1.1.
- Supports 0.576 Mbit / s and 1.152 Mbit / s Medium Infrared (MIR).
- Supports 4 Mbit / s FIR IrDA 1.4.

- Support CIR remote control or wireless keyboard.

IR-RX is connected to the onboard infrared receiver, remote control receiver can be applied directly to do.

IR-TX for user extensions. IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definition"。

Infrared receiver



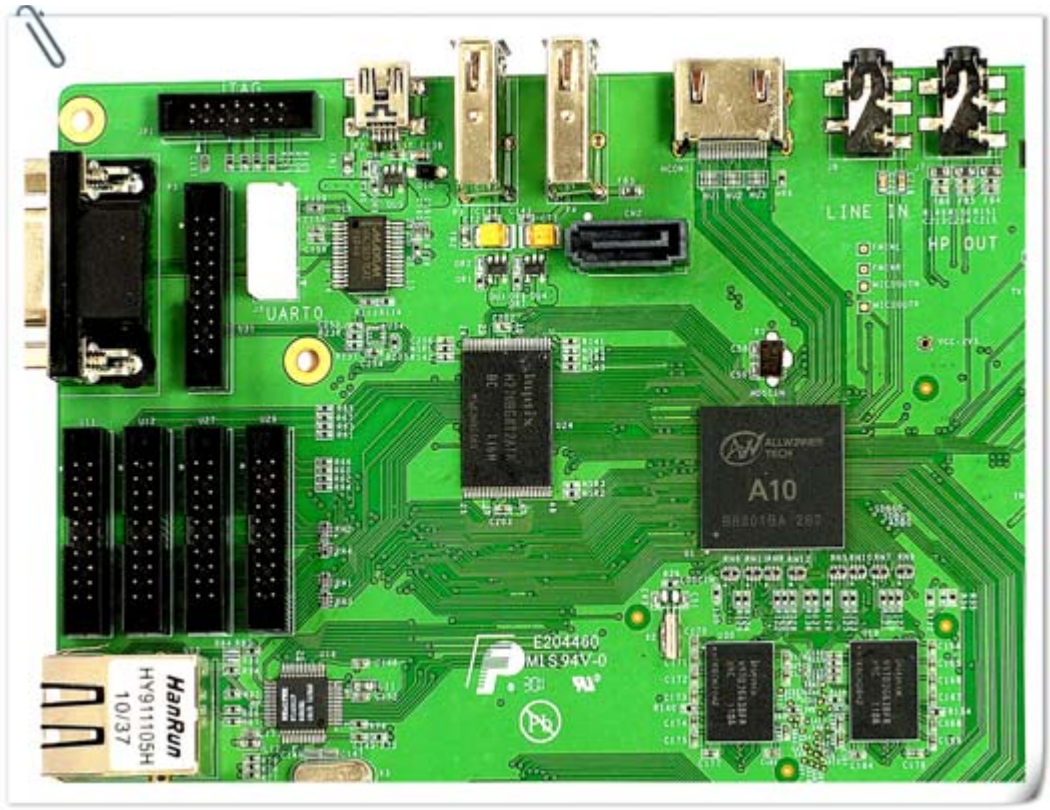
1.38 UART

Development board provides one UART interface: UART0.

Is the standard UART0 RX, TX two-wire serial interface, debug printing as the default interface, the default baud rate is 115200. UART0 supports TTL-level output can be connected to serial port supporting USB (TTL) lines, such as user-friendly notebook PC without RS232 port for debugging print. UART0 also supports RS232 level output. RS232 level output port Using DB9 female socket.

RS232 DB9 UART0

TTL UART0



1.39 Camera sensor interfaces

Camera sensor development board provides two sets of interface signals. Its characteristics are as follows:

- NTSC and PAL CCIR656 agreement.
- Supports 8-bit input data.
- TWI signal and provides a set of two GPIO signals for controlling the camera to use.
- Provides 2.8V and 5V power supply.

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.40 Transport Stream Interface

A10 Transport Stream controller has the following features:

- One external Synchronous Parallel Interface (SPI) or one external Synchronous Serial Interface (SSI)。
- 32 channels PID filter
- Multiple transport stream packet (188, 192, 204) format support
- SPI and SSI timing parameters are configurable
- Hardware packet synchronous byte error detecting

- Hardware PCR packet detecting
- Configurable SPI transport stream generator for streams in DRAM memory
- DMA is supported for transferring data
- Interrupt is supported
- Support DVB-CSA V1.1 Descrambler

Development board offers two TS signal for the Mobile TV use.

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.41 TWI Interface (Two Wire Interface)

A10 TWI interface has the following characteristics:

- Software-programmable for Slave or Master
- Supports Repeated START signal
- Multi-master systems supported
- Allows 10-bit addressing with 2-Wire bus
- Performs arbitration and clock synchronization
- Own address and General Call address detection
- Interrupt on address detection
- Supports speeds up to 400Kbits/s (‘fast mode’)
- Allows operation from a wide range of input clock frequencies

Development board provides two interfaces for users to extend the use of TWI.

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.42 Gyro Interface

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.43 G-Sensor Interface

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.44 Light Sensor Interface

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.45 GPS Interface

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.46 Bluetooth Interface

IDC socket to form for users to expand the development, definition of socket signals see "expansion socket signal definitions."

1.47 External Interrupt (EINT)

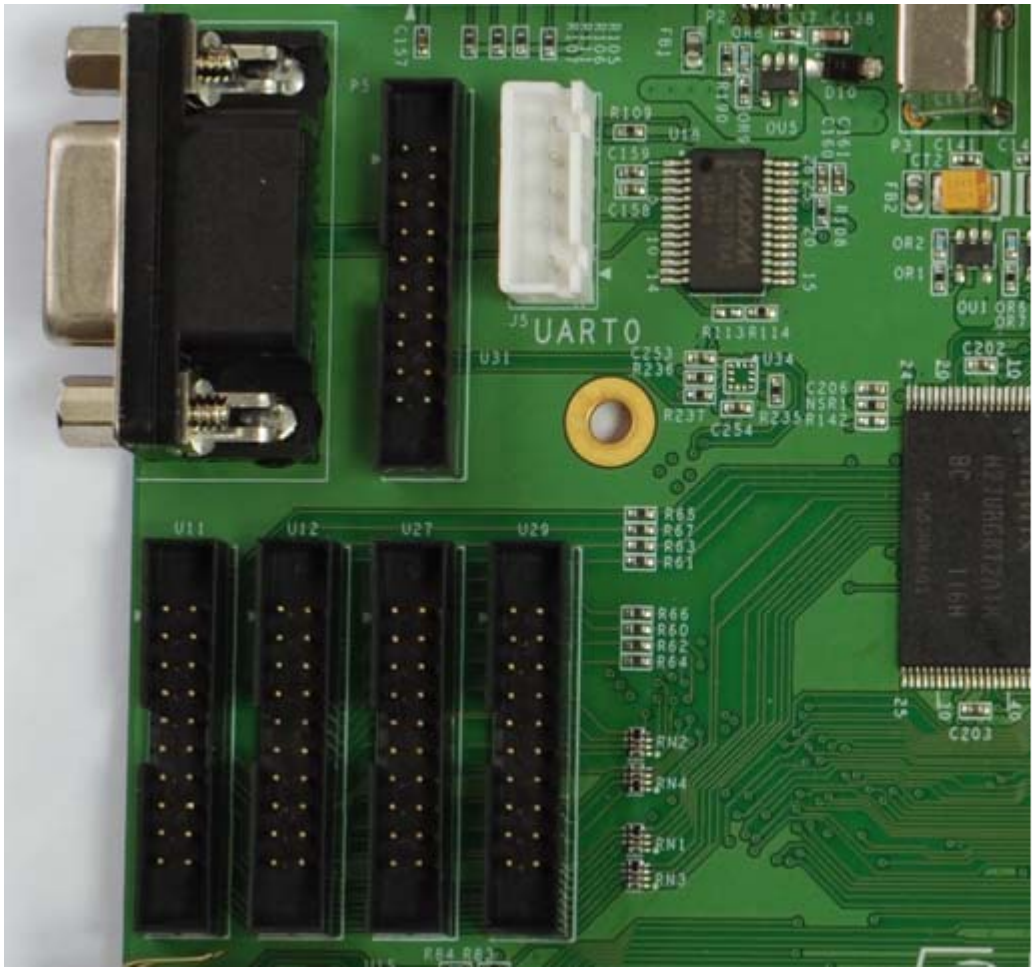
A10 provides up to 32 external interrupts. Development board will be one of the 20 external interrupts to IDC socket for the user to extend the form of development, definition of socket signals see "expansion connector signal definitions."

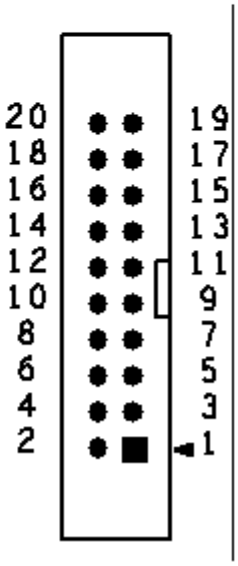
1.48 signal defined expansion header

Development board provides five 2.0mm IDC-20 socket for expansion capabilities. Users can use our complementary capabilities to extend sub-board functional development, or design their own sub-board for extensions development. This section will describe the form of a list of the PIN of the expansion header pin signal definitions and functions.

Caution is as follows:

- The same PIN can only be used at the same time the same function.
- Recommend using the recommended function, there will be a better software support, thus reducing development effort and workload.
- The default state is GPIO GPIO input, if used for output, then the external pull-up resistor on the circuit or a pull-down resistor. Required to determine the polarity of the signal is to spend or pull-down resistors.





1.48.1 IDC socket U11

Socket	U11			
PIN number	Function 1	Function 2 (recommended)	Function 3	Function 4
	GPIO	Camera Sensor 0	Transport Stream 0	External interrupt
1	VCC-5V	VCC-5V	VCC-5V	VCC-5V
2	GPIOH16	CSI0-PWR		EINT16
3		CSI-IO-2.8V		
4	GPIOH13	CSI0-RST#		EINT13
5	GPIOE0	CSI0-PCK	TS0-CLK	
6	GPIOB18	TWI1-SCK		
7	GPIOB19	TWI1-SDA		
8	GPIOE3	CSI0_VSYNC	TS0_DVLD	
9	GPIOE2	CSI0_HSYNC	TS0_SYNC	
10	GPIOE1	CSI0_CK	TS0_ERR	

11	GPIOE4	CSI0_D0	TS0_D0	
12	GPIOE5	CSI0_D1	TS0_D1	
13	GPIOE6	CSI0_D2	TS0_D2	
14	GPIOE7	CSI0_D3	TS0_D3	
15	GPIOE8	CSI0_D4	TS0_D4	
16	GPIOE9	CSI0_D5	TS0_D5	
17	GPIOE10	CSI0_D6	TS0_D6	
18	GPIOE11	CSI0_D7	TS0_D7	
19	GND	GND	GND	GND
20	GND	GND	GND	GND

1.48.2 IDC socket U12

Socket	U12					
PIN number	Function 1	Function 2 (recommended)	Function 3	Function 4	Function 5	Function 6
	GPIO	Camera Sensor 1	Transport Stream 1	SD Card 1	UART3/4	External interrupt
1	VCC-5V	VCC-5V	VCC-5V	VCC-5V	VCC-5V	VCC-5V
2	GPIOH17	CSI1-PWR				EINT17
3		CSI-IO-2.8V				
4	GPIOH14	CSI1-RST#				EINT14
5	GPIOG0	CSI1-PCK	TS1-CLK	SDC1_CMD		
6	GPIOB18	TWI1-SCK				
7	GPIOB19	TWI1-SDA				
8	GPIOG3	CSI1_VSYNC	TS1_DVLD	SDC1_D1		
9	GPIOG2	CSI1_HSYNC	TS1_SYNC	SDC1_D0		
10	GPIOG1	CSI1_CK	TS1_ERR	SDC1_CLK		
11	GPIOG4	CSI1_D0	TS1_D0	SDC1_D2		
12	GPIOG5	CSI1_D1	TS1_D1	SDC1_D3		
13	GPIOG6	CSI1_D2	TS1_D2		UART3_TX	
14	GPIOG7	CSI1_D3	TS1_D3		UART3_RX	
15	GPIOG8	CSI1_D4	TS1_D4		UART3_RTS	

16	GPIOG9	CSI1_D5	TS1_D5		UART3_CTS	
17	GPIOG10	CSI1_D6	TS1_D6		UART4_TX	
18	GPIOG11	CSI1_D7	TS1_D7		UART4_RX	
19	GND	GND	GND	GND	GND	GND
20	GND	GND	GND	GND	GND	GND

1.48.3 IDC socket U27

Socket	U27			
PIN number	Function 1	Function 2 (recommended)	Function 3	Function 4
	GPIO	WIFI/PA/LS/GS/CP/TWI1/GY	IR0	External interrupt
1	VCC-5V	VCC-5V	VCC-5V	VCC-5V
2	GPIOH9	WIFI-SHDN# (SDIO WIFI standby control)		EINT9
3	VCC-3.3V	VCC-3.3V	VCC-3.3V	VCC-3.3V
4	GPIOH12	WIFI-PWR (SDIO WIFI power control)		EINT12
5	GPIOI3			
6	GPIOH10	WIFI-WAKEUP (SDIO WIFI wakeup)		EINT10
7				
8	GPIOH15	PA-SHDN# (Audio PA shutdown control signal)		EINT15
9	GPIOH20	LS-INT (Light sensor interrupt input)		EINT20
10	GPIOH0	GS-INT1 (External G-sensor interrupt input signal)		EINT0
11	GPIOB3	CP-RST# (Compass reset signal)	IR0-TX	
12	GPIOI13	CP-INT (Compass interrupt input)		EITN25
13	GND	GND	GND	GND
14	GND	GND	GND	GND
15	GPIOB18	TWI1-SCK		
16	GPIOB19	TWI1-SDA		
17	GPIOH18	GY-INT1 (Gyroscope interrupt input)		EINT18
18	GPIOH19	GY-INT2		EINT19

		(Gyroscope interrupt input)		
19	GND	GND	GND	GND
20	GND	GND	GND	GND

1.48.4 IDC socket U29

Socket	U29			
PIN number	Function 1	Function 2 (recommended)	Function 3	Function 4
	GPIO	GPS/TWI1/LRADC1/TP	PS2-1	External interrupt
1	VCC-5V	VCC-5V	VCC-5V	VCC-5V
2	GPIOI0	GPS-CLK (GPS clock signal)		
3	VCC-3.3V	VCC-3.3V	VCC-3.3V	VCC-3.3V
4	GPIOI1	GPS-SIGN (GPS data0)		
5	GPIOI14	GPS-OSC-EN (GPS clock control)	PS2-SCK1	EINT26
6	GPIOI2	GPS-MAG (GPS data1)		
7	GPIOC22	GPS-VCC-EN (GPS power control)		
8	GPIOC19	GPS-SCS (GPS SPI chip select)		
9	GPIOI15	GPS-RX-EN (GPS RX enable)	PS2-SDA1	EINT27
10	GPIOC20	GPS-SCLK (GPS SPI serial clock)		
11		LRADC1 (Low Resolution ADC input)		
12	GPIOC21	GPS-MOSI (GPS SPI data output)		
13	GND	GND	GND	GND
14	GND	GND	GND	GND
15	GPIOB20	TWI2-SCK		
16	GPIOB21	TWI2-SDA		
17	GPIOH21	TP-INT (External TP interrupt input)		EINT21
18	GPIOB13	TP-WAKEUP (External TP wake up)		

19	GND	GND	GND	GND
20	GND	GND	GND	GND

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Socket	U31				
PIN number	Function 1	Function 2 (recommended)	Function 3	Function 4	Function 5
	GPIO	Bluetooth	UART2	PS2-0	External interrupt
1	VCC-5V	VCC-5V	VCC-5V	VCC-5V	VCC-5V
2	GPIOB5	BT-RST# (Bluetooth reset)			
3	VCC-3.3V	VCC-3.3V	VCC-3.3V	VCC-3.3V	VCC-3.3V
4	GPIOB6	BT-PCM-CLK (Bluetooth PCM clock signal)			
5	GPIOB12	BT-PCM-IN (Bluetooth PCM data input)			
6	GPIOB7	BT-PCM-SYNC (Bluetooth PCM sync)			
7	GPIOI16	BT-UART-RTS (Bluetooth UART RTS)	UART2-RTS		EINT28
8	GPIOB8	BT-PCM-OUT (Bluetooth PCM data out)			
9	GPIOI18	BT-UART-TX (Bluetooth UART TX)	UART2-TX		EINT30
10	GPIOI17	BT-UART-CTS (Bluetooth UART CTS)	UART2-CTS		EINT29
11	GPIOI20	BT-GPIO0 (Bluetooth GPIO)		PS2-SCK0	
12	GPIOI19	BT-UART-RX (Bluetooth UART RX)	UART2-RX		EINT31
13	GND	GND	GND	GND	GND

14	GND	GND	GND	GND	GND
15	GPIOI21	BT-GPIO1 (Bluetooth GPIO)		PS2-SDA0	
16	GPIOI12				
17	GPIOI10	GS-INT2			
18	GPIOI11				
19	GND	GND	GND	GND	GND
20	GND	GND	GND	GND	GND